



AUTO RADIO SERVICE DATA

+AR-289+

ARA 6703212/CB

**Audiovox CP-750, ID-700,
GM-CXP, 77178-CXP**

Chrysler 4048142, 4048370

Cobra 98GTL, 99GTL

Craig S680

Delco 90BPB1/BK1, 93BPB1/BK1

Grundig GRV-1700

Motorola 3C4TEC8





AUTO RADIO

SERVICE DATA

AR-289

REPRODUCED THROUGH THE COURTESY OF THE MANUFACTURER



HOWARD W. SAMS & CO., INC.
INDIANAPOLIS INDIANA

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GENERAL SERVICING INFORMATION

The following information applies to all tape units in this volume, and should be followed before any adjustments are made or trouble diagnosis is attempted. Any exceptions or additions will be found in the detailed servicing procedures for each tape unit.

POWER SOURCES

Many tape units require full supply voltage for proper operation. Be sure the supply voltage is maintained at the rated value under load while making adjustments.

CLEANING

All head faces should be cleaned with head cleaner or methyl alcohol to remove dust and accumulated oxide. (An applicator may be fashioned from absorbent cotton.) Do not use a screwdriver or any metallic object near the head faces.

CAUTION: Avoid getting head cleaner on any plastic surface.

Clean capstans, pressure rollers, and tape guides with alcohol using a soft lint-free cloth. Also use alcohol to remove oil and grease from drive belts and other driving surfaces.

LUBRICATING

Clean all surfaces before lubricating. Apply a few drops of #20 machine oil to all bearings and rotating bushings. Apply a thin film of light, nonhardening grease to all cam surfaces and pawls, if they have been factory lubricated. Always wipe excess oil or grease from parts that have been lubricated.

CAUTION: Oil and grease must be kept off all driving surfaces as well as any parts which may transfer oil or grease to them.

DEMAGNETIZING

Heads require demagnetizing at regular intervals to maintain high-frequency response, dynamic range, and low distortion. (Follow instructions included with the demagnetizing unit.) After demagnetizing the heads, keep all screwdrivers and other metallic objects away from the head faces. Tape guides may also require occasional demagnetizing.

IMPORTANT: Be sure to demagnetize the heads after making resistance measurements in the head circuits.

CARTRIDGES

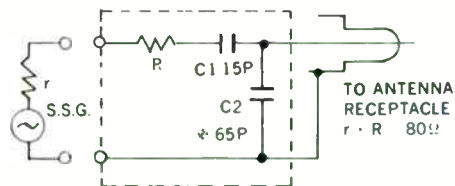
Many problems associated with tape units result from defective cartridges. Always try a cartridge known to be good before attempting repairs.

ALIGNMENT PROCEDURES

AM ALIGNMENT

EQUIPMENT REQUIRED

- 1) AM signal generator: 450 ~ 1700 kHz
- 2) Dummy antenna: Refer to Fig. 2.
- 3) Output meter: AC voltmeter
- 4) Power supply: DC 14.5 V



† Including the feeder capacity

Fig. 2 AM Dummy Antenna

PROCEDURE

- 1) Connect output meter.
- 2) Set volume control to maximum, and tone control to treble.
- 3) Connect signal generator to antenna receptacle through dummy antenna.
- 4) Keep signal generator output low enough to prevent A.G.C. overload.
- 5) Move slide switch to right for AM band reception.
- 6) Refer to Fig. 1.

● AM IF & RF ALIGNMENT USING AM SIGNAL GENERATOR

STEP	GENERATOR FREQUENCY	DIAL SETTING	ADJUST	REMARKS
1	455 kHz 400Hz, 30% Mod.	Point of non-interference	T302 T305	Adjust for maximum output
2	520 kHz 400Hz, 30% Mod.	Tune for min.	T301	Adjust for maximum output
3	1650 kHz 400Hz, 30% Mod.	Tune for max.	CT302	Adjust for maximum output
4	1400 kHz 400Hz, 30% Mod.	Tune to signal	CT001 CT301	Adjust for maximum output
5	Repeat step 2, 3 and 4 until no further increase. Step 4 should be last step.			

When radio is installed in car adjust trimmer capacitor CT001 for maximum output while receiving a weak station near 1400 kHz.

● AM IF ALIGNMENT USING AM SWEEP GENERATOR

High side of sweep generator through 0.01 mfd to point \diamond (Antenna receptacle A.J.), low side to ground.

STEP	DIAL SETTING	INDICATOR CONNECTION	ADJUST	REMARKS
6	Point of non-interference	Vert amp. of scope to point \diamond (VR Terminal) low side to ground.	T302 T305	Adjust T302, T305 for maximum gain as shown in Fig. 3.



Fig. 3

FM ALIGNMENT EQUIPMENT

- 1) FM signal generator: 80 130 MHz
- 2) Dummy antenna: Refer to Fig. 4
- 3) Output meter: AC voltmeter
- 4) Power supply: DC 14.5 V

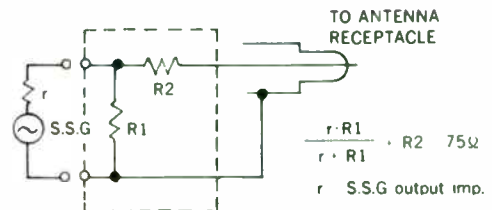


Fig. 4 FM Dummy Antenna

PROCEDURE

- 1) Connect output meter across speaker terminals.
- 2) Set volume control to maximum and tone control to treble.
- 3) Connect signal generator to antenna receptacle through dummy antenna.
- 4) Move slide switch to left for FM band reception.
- 5) Refer to Fig 1.

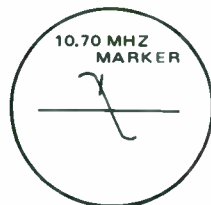
● FM IF ALIGNMENT USING FM SWEEP GENERATOR

High side of sweep generator through 0.01 mfd to test point \diamond low side to ground.

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 stated below.
RED: 10.7MHz, BLUE: 10.67MHz, ORANGE: 10.73MHz, BLACK: 10.64 MHz, 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. 7).
- 3) The colour of Ceramic Filters used is different according to the production, but the same colour-dotted Ceramic Filters should be replaced as one pair in the individual unit.
- 4) Be careful 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.

STEP	GENERATOR FREQUENCY	DIAL SETTING	INDICATOR CONNECTION	ADJUST	REMARKS
7	10.7 MHz	Point of non-interference	Vert amp. of scope to point \diamond (VR terminal), low side to ground.	T101	Adjust T101, until the waveform similar to Fig. 6 is obtained.
8	10.7 MHz	Point of non-interference.	Vert amp of scope to point \diamond (VR terminal) low side to ground.	T203 T202	Adjust for maximum amplitude and straightness of signal as shown in Fig. 6.



WHITE DOT



RED DOT

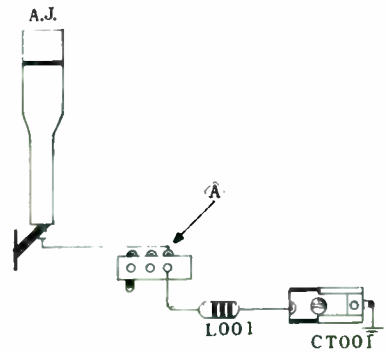
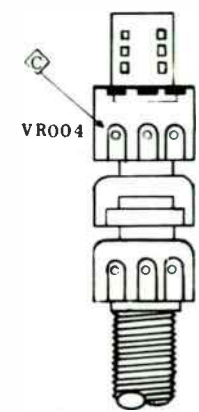
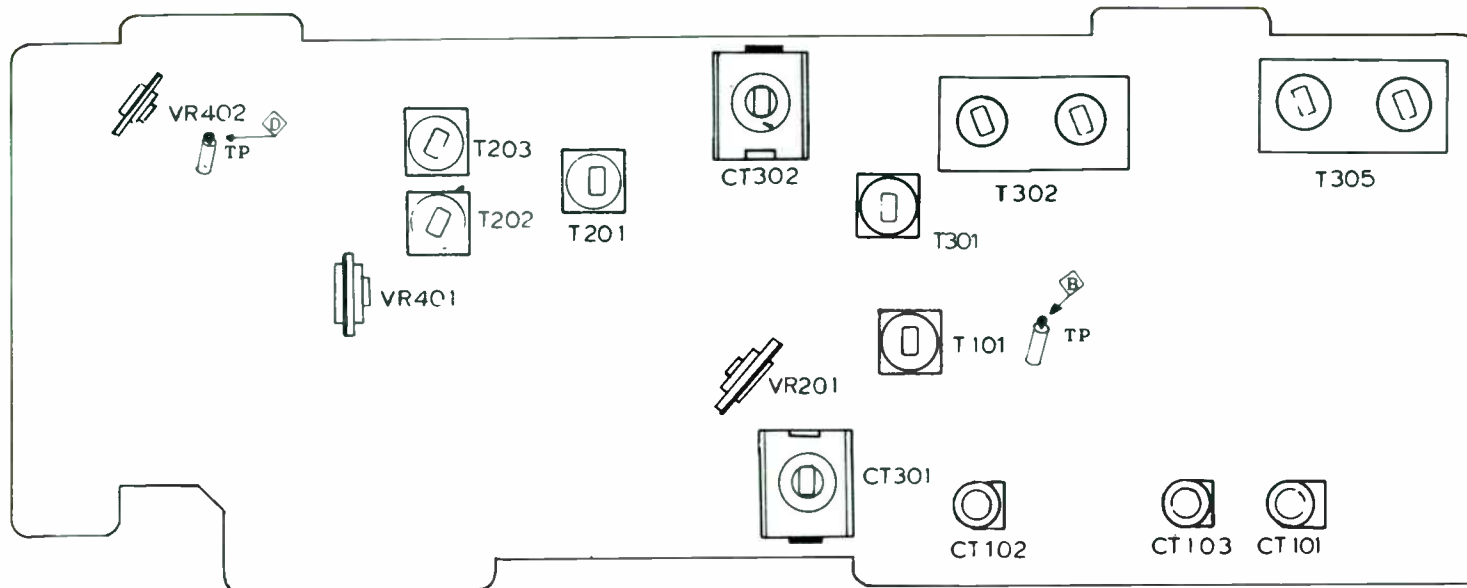


BLACK OR BLUE DOT

Fig. 5

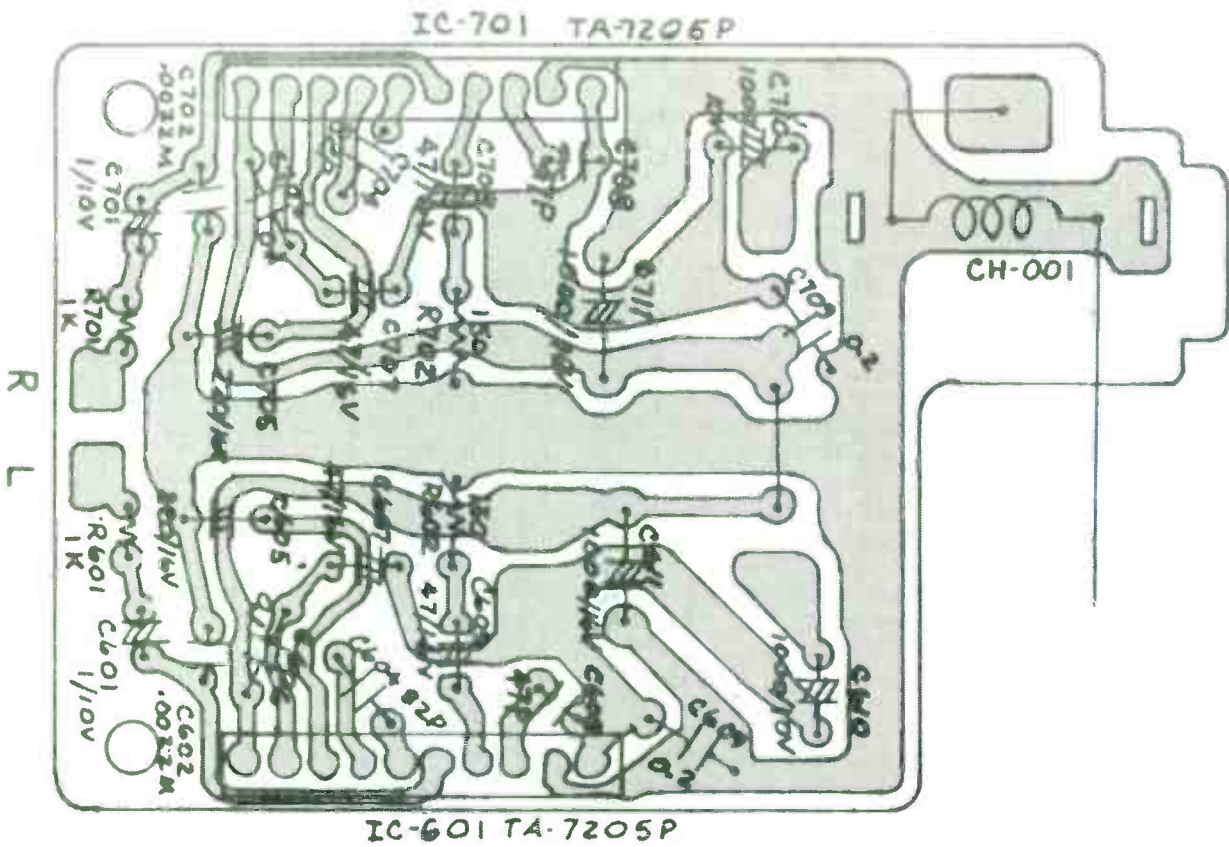
FM ALIGNMENT USING FM SIGNAL GENERATOR

STEP	GENERATOR FREQUENCY	DIAL SETTING	INDICATOR CONNECTION	ADJUST	REMARKS
9	87.0 MHz (400Hz Mod.) (22.5kHz dev.)	Tune to min.	Output meter across voice coil	CT103	Adjust for maximum output.
10	98 MHz (400Hz Mod.) (22.5 kHz dev.)	Tune to signal	Output meter across voice coil	CT101 CT102	Adjust for maximum output
11	98 MHz (400Hz Mod.) (22.5 kHz dev.)	Tune to signal.	Output meter across voice coil.	VR201	Adjust VR201 for limiting sensitivity at 15 dB.

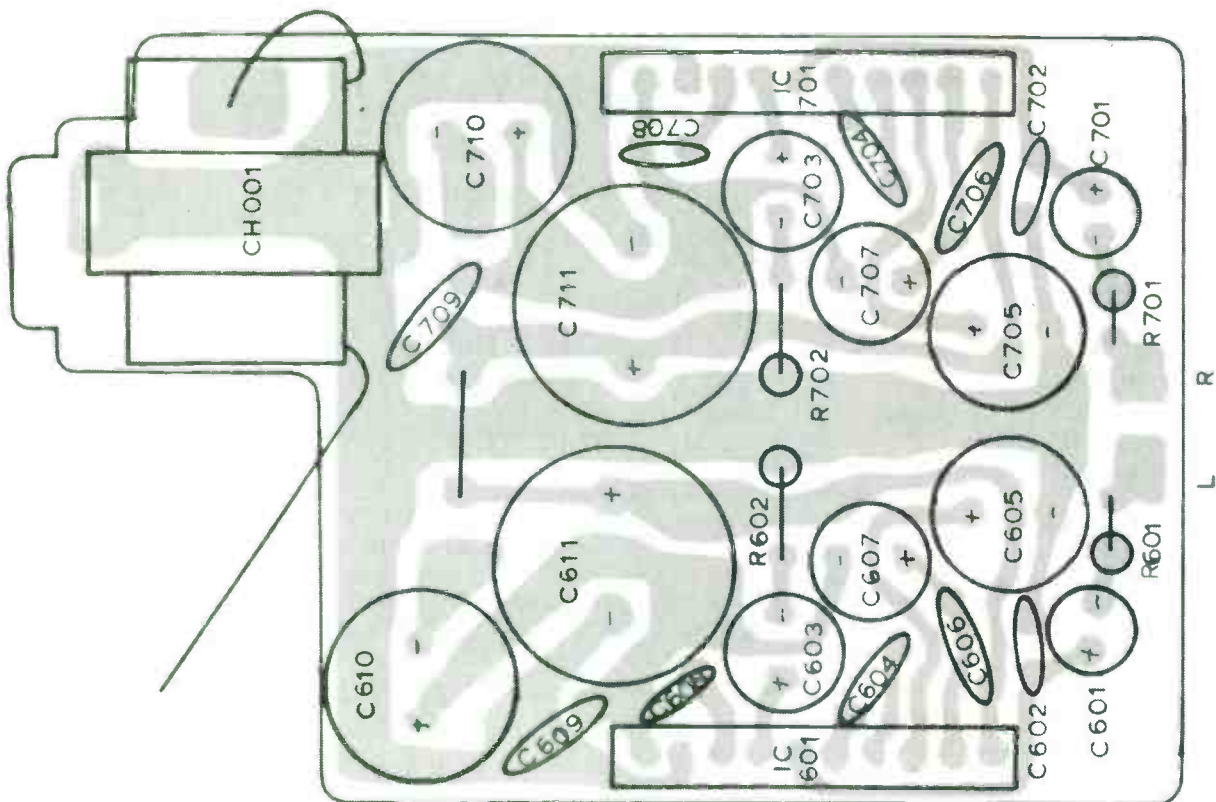


ALIGNMENT POINTS 3212/CB

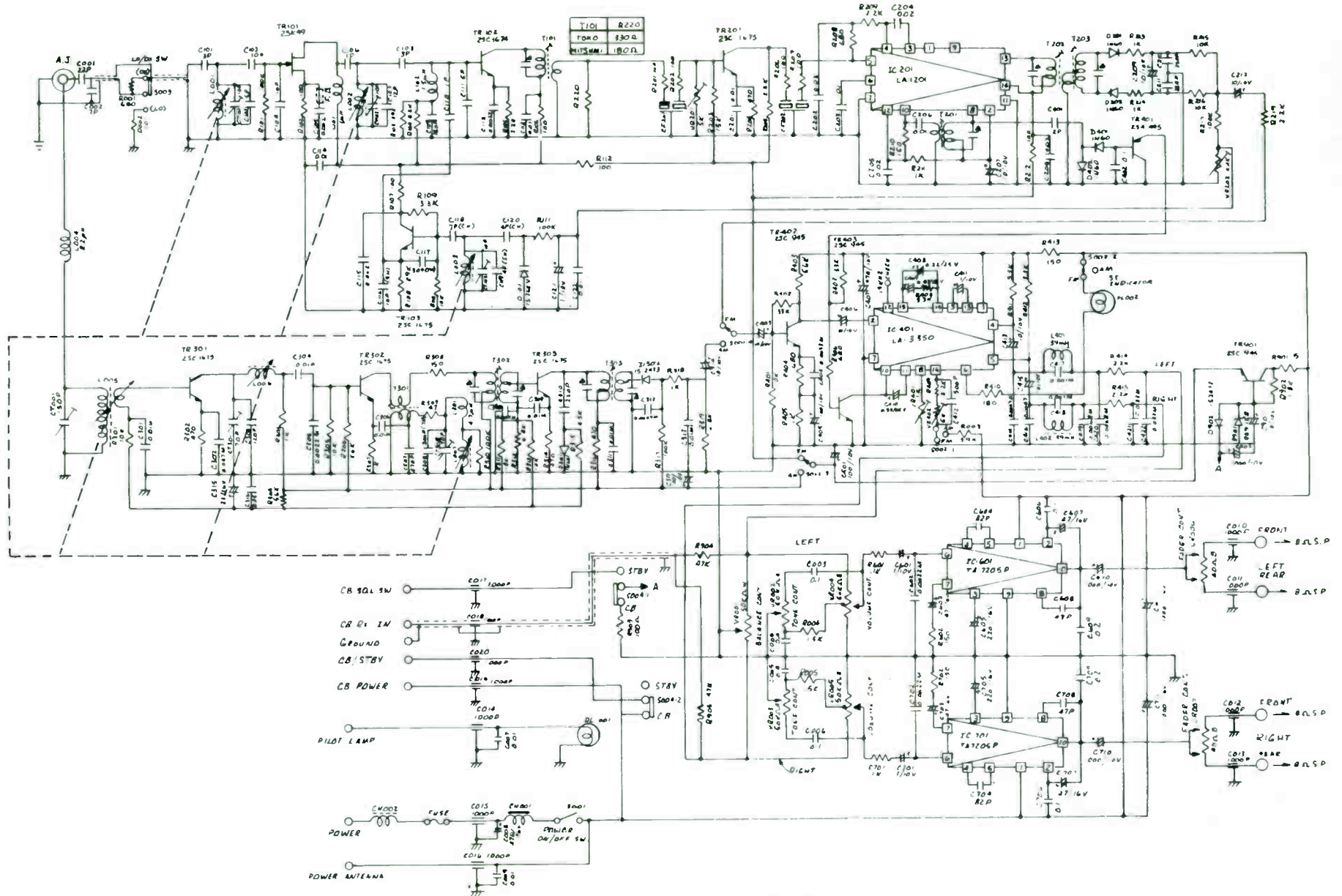
Fig. 1 Component View of Alignment Point



Bottom View Audio Amp PCB



Top View Audio Amp PCB



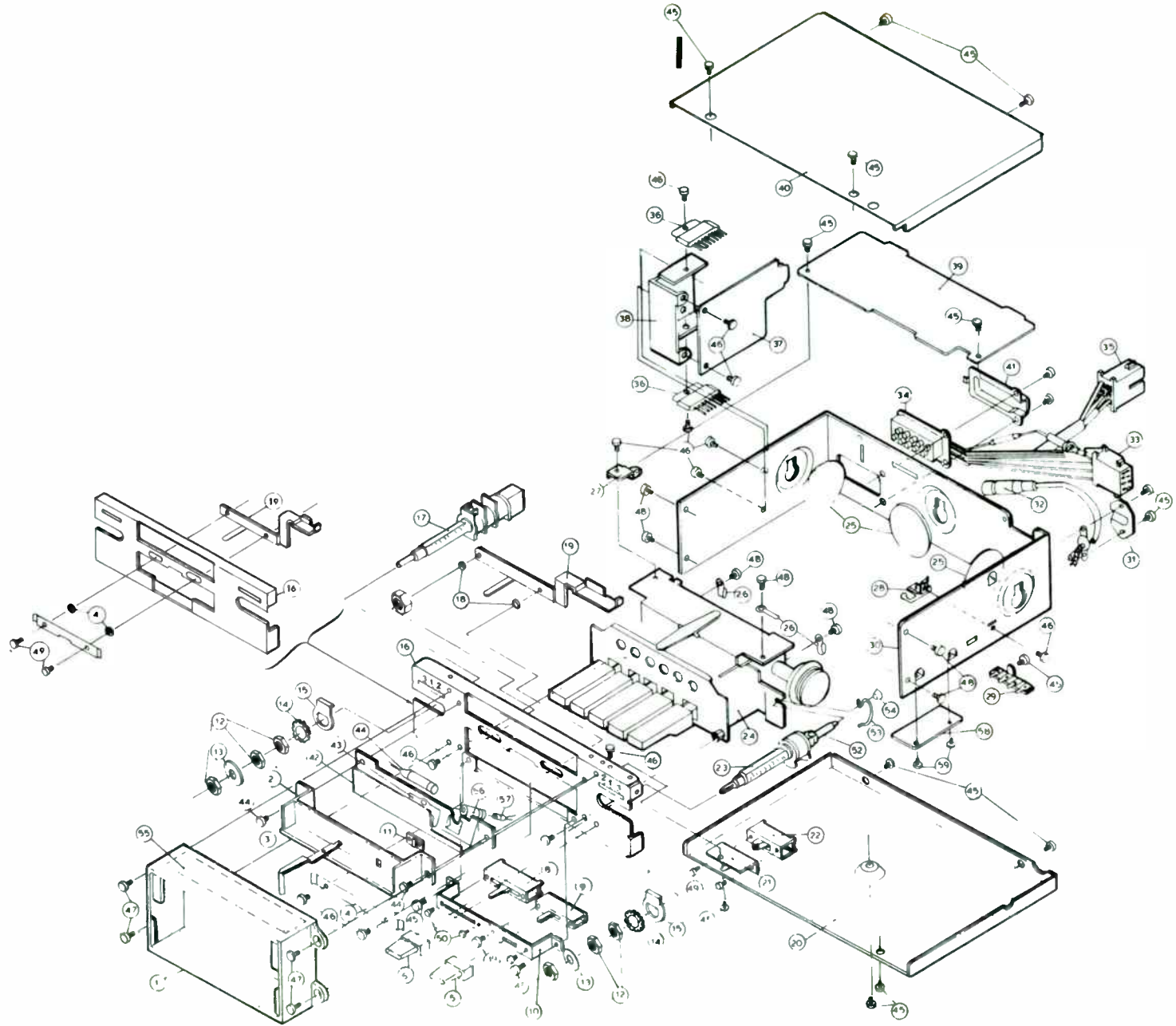
Schematic

VOLTAGE CHART

F.E.T.	TR 101	TRANSISTORS	TR 102	TR 103	TR 201	TR 301	TR 302	TR 303	TR 401	TR 402	TR 403	TR 901
GATE	.01	BASE	2.40	.01	1.48	.88	7.97	1.7	0	1.6	.65	8.1
SOURCE	7.63	EMITTER	1.68	4.88	.78	.18	1.16	1.00	.61	1	0	7.4
DRAIN	.11	COLLECTOR	7.56	7.46	4.48	7.70	8.07	7.09	0	7.94	.02	13.8

PIN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
IC201	2.83	3.10	.72	1.35	1.33	.62	0	3.10	.7	2.17	0	2.18	7.32	7.33		
IC401	12.25	2.97	5.74	9.60	9.64	0	0	.52	6.52	.01	2.13	.21	1.53	1.52	2.14	6.63
IC601	14.45	13.35	4.22	8.60	1.36	3.60	3.60	1.35	.00	7.26						
IC701	14.45	13.35	4.22	8.60	1.36	3.60	3.60	1.35	.00	7.26						

All voltages measured with a VTVM with no signal input in FM position exceptions below.
 *Taken in AM position, no signal input.



Exploded View

ELECTRICAL PARTS

SYMBOL	DESCRIPTION	PART NO.	SYMBOL	DESCRIPTION	PART NO.
CAPACITORS			C211	Ceramic 220P	6701099
C001	Ceramic 22P	6701098	C212	Electrolytic 10uF 10V	6701627
C002	Ceramic 7P	6701089	C301	Mylar 0.01uF	6701170
C003	Ceramic 0.1uF Z	6701113	C302	Mylar 0.047uF	6701179
C004	Ceramic 0.4uF Z	6720193	C303	Ceramic 120P	6701094
C005	Ceramic 0.4uF Z	6720193	C304	Mylar 0.01uF	6701170
C006	Ceramic 0.1uF Z	6701113	C305	Mylar 0.0022uF	6701172
C007	Ceramic 0.01uF Z	6701117	C306	Mylar 0.01uF	6701170
C008	Electrolytic 470uF 16V	6701308	C307	Ceramic 470P	6701103
C009	Ceramic 0.01uF Z	6701117	C308	Ceramic 220P N-470	6701068
C101	Ceramic 3P	6701085	C309	Mylar 0.01uF	6701170
C102	Ceramic 5P	6701087	C310	Ceramic 220P	6701099
C103	Ceramic 10P	6701091	C311	Mylar 0.01uF	6701170
C104	Ceramic 10P	6701091	C312	Mylar 0.0047uF K	6701156
C105	Ceramic 0.002uF Z	6720190	C313	Mylar 0.01uF M	6701170
C106	Ceramic 1P	6701111	C314	Electrolytic 10uF 10V	6701627
C107	Ceramic 12P	6701093	C315	Electrolytic 33uF 16V	6701304
C108	Ceramic 3P	6701085	C316	Ceramic 0.05uF Z	6701121
C109	Ceramic 150P	6701096	C371	Electrolytic 100uF 10V	6701299
C110	Ceramic 1P	6720188	C318	Mylar 0.022uF	6701173
C111	Ceramic 5P	6701087	C401	Ceramic 2P	6701084
C112	Ceramic 0.002uF Z	6720190	C402	Ceramic 0.1uF Z	6701113
C113	Ceramic 0.01uF Z	6701117	C403	Electrolytic 10uF 10V	6701627
C114	Ceramic 0.01uF Z	6701117	C404	Mylar 0.0033uF K	6701155
C115	Ceramic 0.002uF Z	6720190	C405	Electrolytic 100uF 10V	6701299
C116	Ceramic 10P N-330	6702314	C406	Electrolytic 10uF 10V	6701627
C117	Ceramic 30P N-470	6702315	C407	Electrolytic 470uF 16V	6701308
C118	Ceramic 7P NP-0	6720192	C408	Electrolytic 0.22uF 25V	6701826
C119	Ceramic 4P N-330	6720191	C409	Electrolytic 0.47uF 25V	6701828
C120	Ceramic 4P NP-0	6701066	C410	Electrolytic 0.33uF 25V	6701827
C121	Electrolytic 1uF 10V	6701637	C411	Electrolytic 1uF 10V	6701637
C122	Ceramic 0.01uF Z	6701117	C412	Styrol Seal 1500P	6701812
C201	Ceramic 0.01uF Z	6701117	C413	Electrolytic 10uF 10V	6701627
C202	Ceramic 0.02uF Z	6701116	C414	Mylar 0.0047uF K	6701156
C203	Ceramic 0.1uF Z	6701113	C415	Electrolytic 10uF 10V	6701627
C204	Ceramic 0.02uF Z	6701116	C416	Mylar 0.0047uF K	6701156
C205	Ceramic 0.02uF Z	6701116	C417	Mylar 0.001uF K	6701154
C206	Ceramic 0.01uF Z	6701117	C418	Mylar 0.001uF K	6701154
C207	Electrolytic 10uF 10V	6701627	C419	Mylar 0.0068uF K	6701176
C208	Ceramic 0.02uF Z	6701116	C420	Mylar 0.0068uF K	6701176
C209	Electrolytic 10uF 10V	6701627	C421	Mylar 0.033uF M	6701177
C210	Ceramic 220P	6701099	C422	Mylar 0.033uF M	6701177
			C601	Electrolytic 1uF 10V	6701637

ELECTRICAL PARTS

SYMBOL	DESCRIPTION	PART NO.	SYMBOL	DESCRIPTION	PART NO.
R402	39K ohm	6701041	TR403	Transistor 2SC-945R	6701316
R403	5.6K ohm	6701047	TR901	Transistor 2SC-945R	6701316
R404	680 ohm	6701051	D101	Diode 1S2687	6701327
R405	1K ohm	6701017	D201	Diode 1N60P	6701322
R406	680 ohm	6701051	D202	Diode 1N60P	6701322
R407	33K ohm	6701038	D301	Diode 1N60P	6701322
R408	3.3K ohm	6701037	D302	Diode 1S2473	6701325
R409	8.2K ohm	6701056	D401	Diode 1N60P	6701322
R410	180 ohm	6701026	D402	Diode 1N60P	6701322
R411	3.3K ohm	6701037	D901	Diode RD9.1EB Zenner	6720196
R412	3.3K ohm	6701037	D902	Diode 1S2473	6701325
R413	150 ohm	6701022	IC201	Integrated Circuit LA1201	6701311
R414	2.2K ohm	6701031	IC401	Integrated Circuit LA3350	6701778
R415	2.2K ohm	6701031	IC601	Integrated Circuit TA7205P	6701779
R601	1K ohm	6701017	IC701	Integrated Circuit TA7205P	6701779
R602	150 ohm	6701022	COILS AND OTHER COMPONENTS		
R701	1K ohm	6701017	T101	FM IFT 1	6701337
R702	150 ohm	6701022	T201	FM IFT 2	6701338
R901	15 ohm	6701597	T202	FM IFT 3	6702382
R902	1.8K ohm	6701027	T203	FM IFT 4	6701010
R903	100 ohm	6701016	T301	AM Patter Coil	6701318
R904	47K ohm	6701572	T302	AM IFT 1	6702374
R905	47K ohm	6701572	T303	AM IFT 2	6702375
VR001	Balance Control	6701672	L101	Choke Coil 1.0uH	6702328
VR002	Volume Control	6701741	L102	Choke Coil 1.5uH	6701332
VR005			L301	Choke Coil 4.7uH	6701005
VR006	Fader Control	6701745	L401	Inductor 39mH	6701808
VR007	Fader Control	6701745	L402	Inductor 39mH	6701808
VR201	Semi-Variable 5K	6701602	CF201	FM Ceramic Filter	6702347
VR202	Semi-Variable 50K	6720062	CF202	Fm Ceramic Filter	6702347
VR401	Semi-Variable 1K	6701604	CH001	Power Choke	6701370
VR402	Semi-Variable 5K	6701602	CT001	Antenna Trimmer 150P	6701836
SEMI-CONDUCTORS			CT101	Ceramic Trimmer 10P	6701844
TR101	Transistor 2SK-49F	6701774	CT102	Ceramic Trimmer 10P	6701844
TR102	Transistor 2SC-1674L	6701776	CT103	Ceramic Trimmer 10P	6701844
TR103	Transistor 2SC-1675L	6701775	CT301	Trimmer 70P	6701837
TR201	Transistor 2SC-1675L	6701775	CT302	Trimmer 70P	6701837
TR301	Transistor 2SC-1675L	6701775			
TR303	Transistor 2SC-1675L	6701775			
TR401	Transistor 2SA-495Y	6701762			
TR402	Transistor 2SC-945R	6701316			

MAIN CHASSIS PARTS

SYMBOL	DESCRIPTION	PART NO.	SYMBOL	DESCRIPTION	PART NO.
	MAIN CHASSIS		28	70P Trimmer	6701837
1	Nosecone Box	6820232	29	1L 3P Lug Terminal	N/A
2	Back Plate	6702748	30	Main Case	N/A
3	Dial Pointer	6702307	31	Antenna Cord Clamp	N/A
4	Slide Spring	6702306	32	Lead Type Antenna Jack	6701290
5	Switch Knob	6720195	33	8P Connector Plug	6702793
6	Balance Knob	6702344	34	Feed Through Capacitor Assy	N/A 6702302
7			35	4P Connector	6702789
8	Balance Control	6701672	36	IC TA7205P	6701779
9			37	Audio P.C. Board	N/A
10	Slide Volume Clamp	6720194	38	Heat Sink	6702342
11	Stereo Indicator	6702747	39	Main P.C. Board	N/A
12	Nut, 3/8"	6701413	40	Top Cover for Case	N/A
13	Washer, Flat 3/8"	6701485	41	Cord Clamp	6702749
14	Washer, External Tooth 3/8"	6701375	42	Light Mask	6702752
15	Washer, Dog	6701259	43	Lamp Holder	6702751
16	Front Panel	N/A	44	Pilot Lamp	6701123
17-	Volume Control w/Rotary, Pull-Push Switch	6701741	45	Screw, CT Bind 3x5	6702223
18	Collar	6701684	46	Screw, Bind 3x5	6701378
19	Slide Lever	6702339	47	Screw, Bind Black 3x6	6701481
20	Bottom Cover for Case	N/A	48	Screw, Bind 3x4	6701380
21	Slide Switch Clamp	6701683	49	Screw, Pan 2.6x4	6701379
22	Band Selector Switch AM/FM	6701675	50	Screw, Pan 2x3	6701427
23	Fader Control	6701745	51	Screw, Flat 3x5	6701643
24	Pushbutton Tuner w/ Chrome Button	6702352	52	Pinion Shaft	6720184
25	Tetron Label	6720160	53	Pinion Spring	6720185
26	Bind Lug	N/A	54	Pinion Collar	6720186
27	P.C. Board Holder	N/A	55	Reflector Label	N/A
			56	Light Grommet	6702753
			57	Stereo Indicator Lamp	6701444
			58	Sub PC Board	N/A
			59	Screw, Bind 2.6x5	6701906

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 with 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 specified source voltage —DC, 14.4 volts —
2. Connect an AC voltmeter (VTVM) across speaker or dummy load (8 ohms, 10W, wire wound resistor)
3. Signal input must be kept as low as possible to avoid overload and clipping use output indicator of highest possible sensitivity.
4. Repeat adjustment to insure good results.
5. Non-metalic alignment tools must be used.
6. Alignment location details: See fig. 8, 9

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. 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 voltmeter.

STEP	GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT INDICATOR	ADJUST	REMARKS
1	262.5KHz 400Hz, 30% mod.	Around 1000KHz of non-interference.	AC VTVM across voice coil (L or R) or 8 ohms load.	T301 T302	Adjust for maximum.
2	1630KHz	High frequency end stop.	"	C310	"
3	1400KHz	Tune to signal	"	C305 C6	"

With radio installed in car and antenna extended to desired height, tune in a weak station around 1400KHz and adjust antenna trimmer (C6) for maximum output.

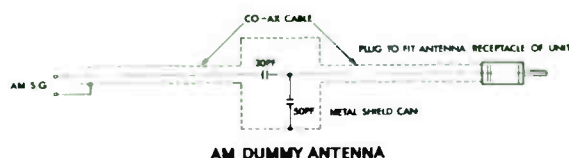


Fig. 2

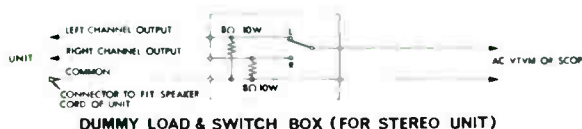


Fig. 3

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 \diamond 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 \diamond low side to ground.	T101	Adjust T101 to obtain symmetry of response similar to fig. 3 or 4 or 5 according to the colour of Ceramic filter used.
2	"	"	"	T201	Adjust T201 for maximum amplitude and straightness of line.
3	Repeat above steps 1 and 2 for 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) 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.

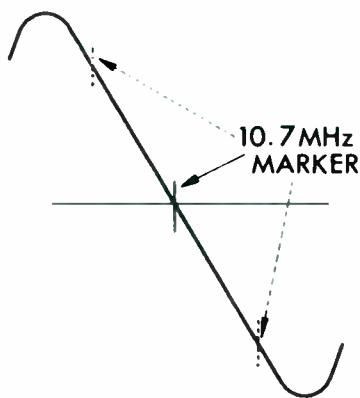


Fig. 4

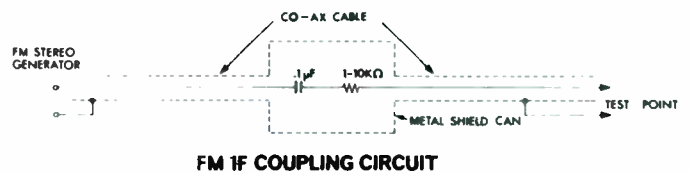


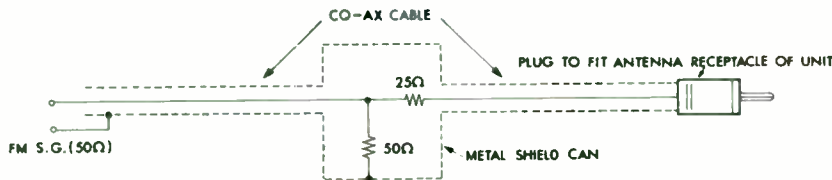
Fig. 5

Audiovox CP-750, ID-700, GM-CXP, 77178-CXP

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	REMARKS
1	108.5MHz (400Hz 22.5KHz dev)	Low frequency end stop	Output meter across 8 ohms load	C120	Adjust for maximum
2	98MHz (400Hz 22.5KHz dev)	Tune for Signal	"	C103 C109	"



FM DUMMY ANTENNA

Fig. 6

FM MULTIPLEX ALIGNMENT USING FREQUENCY COUNTER

Set the radio for FM reception.

STEP	OUTPUT INDICATOR	ADJUST	REMARKS
1	Connect frequency counter to test point \diamond	R-218	Adjust to 19.000KHz (18.950–19.050KHz is permissible)

Note: Test point \diamond should be grounded while adjusting R-218.

FM MULTIPLEX ALIGNMENT WITHOUT USING FREQUENCY COUNTER

STEP	RADIO DIAL SETTING	ADJUST	REMARKS
1	Tune radio to strong FM STEREO station.	R-218	Rotate R-218 CW or CCW and mark the points where the STEREO INDICATOR LAMP is turned off. Then, fix R-218 at the center of the above marked points.

FIX AT THE CENTER

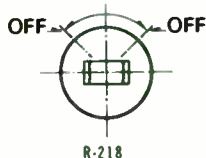


Fig. 7

CASSETTE PLAYER ALIGNMENT USING TEST CARTRIDGE

STEP	ITEM	ADJUSTMENT
1	Head Azimuth	Play a test cassette. monitor LEFT or RIGHT channel output and adjust Azimuth adjustment screw for maximum.

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.

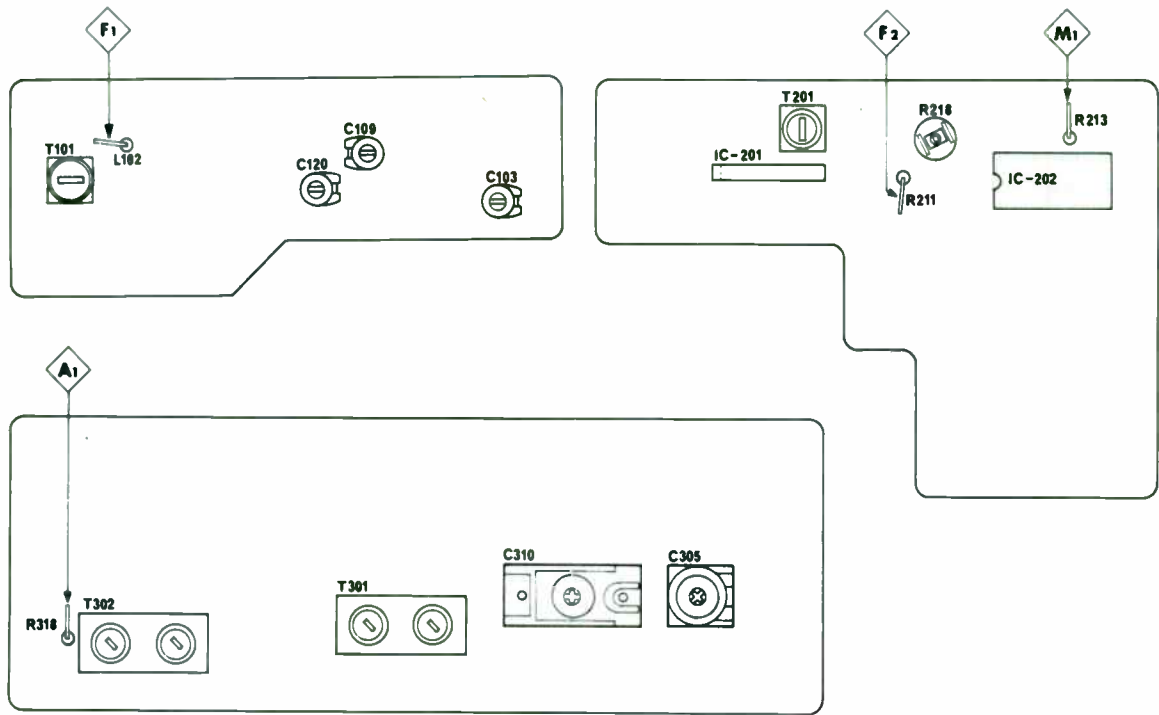


Fig. 8

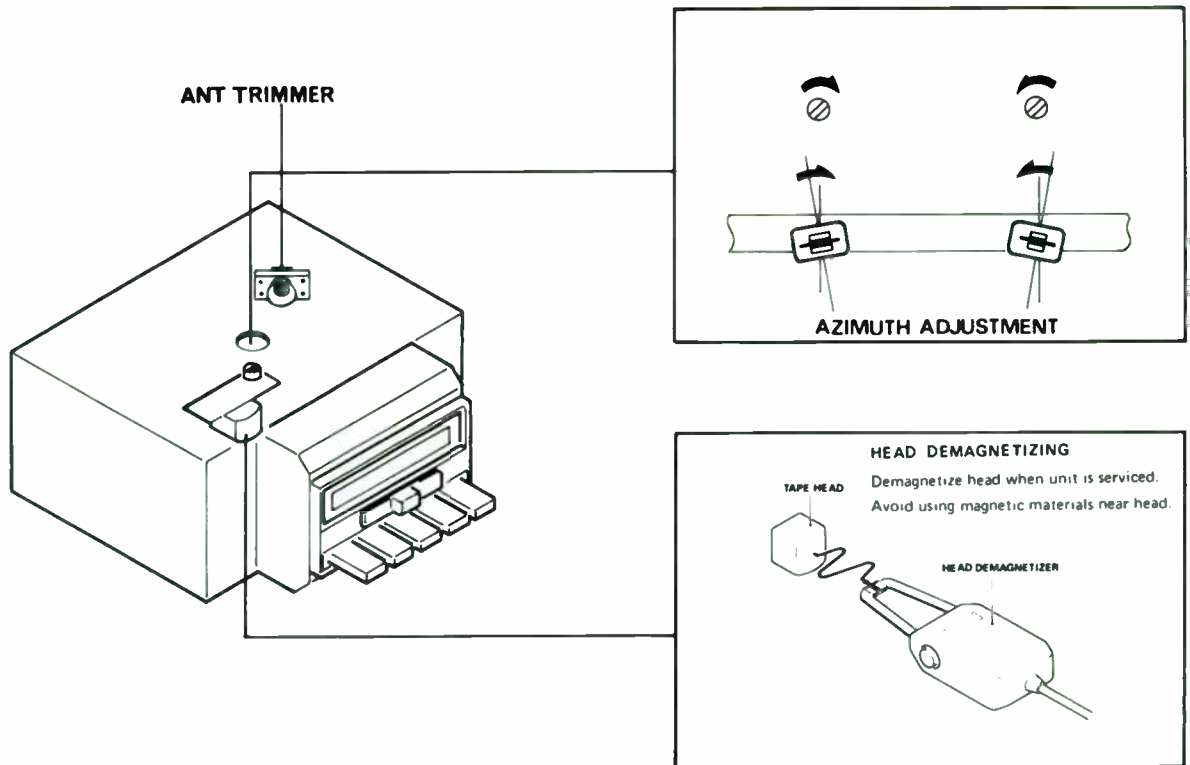
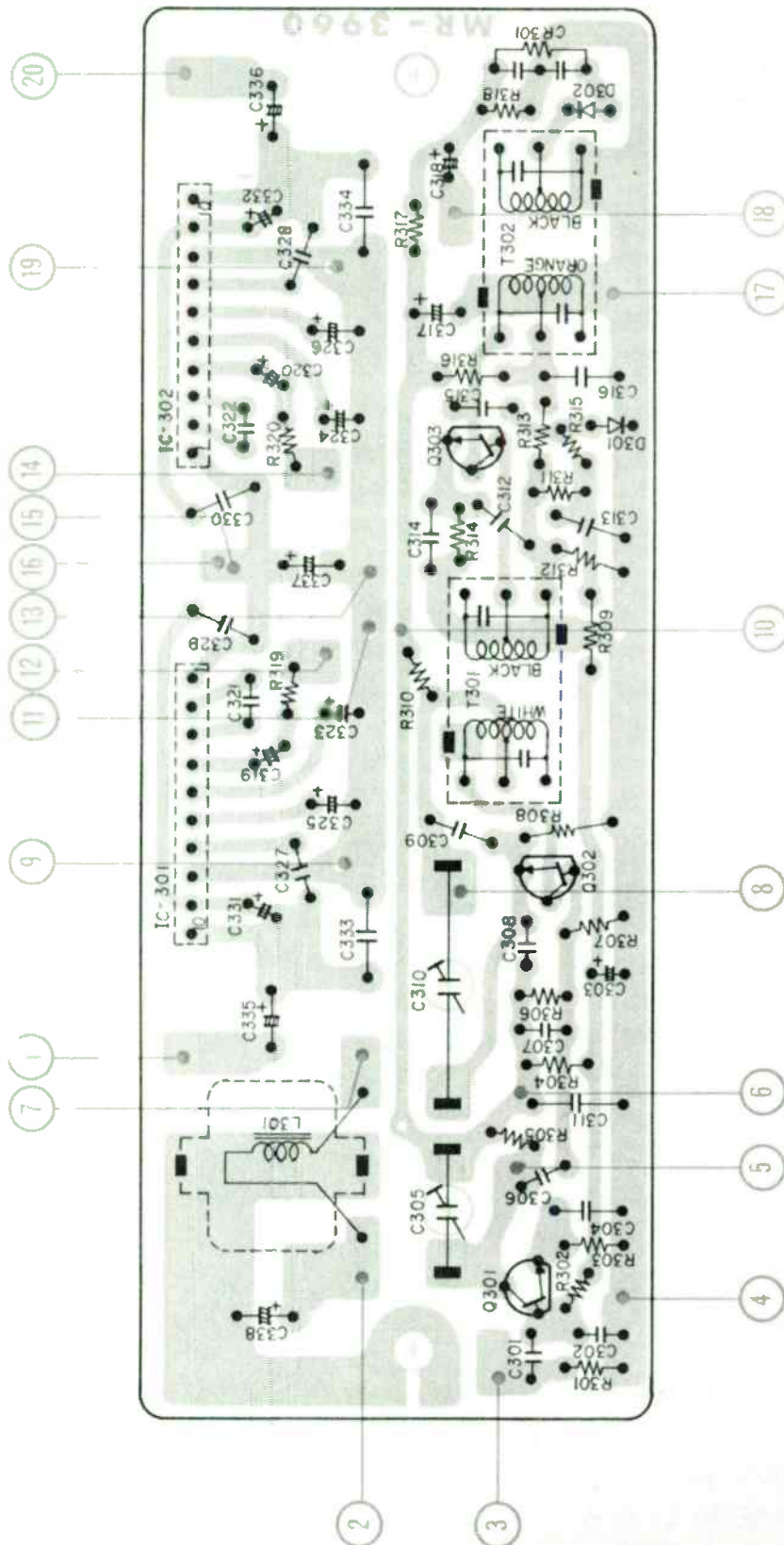


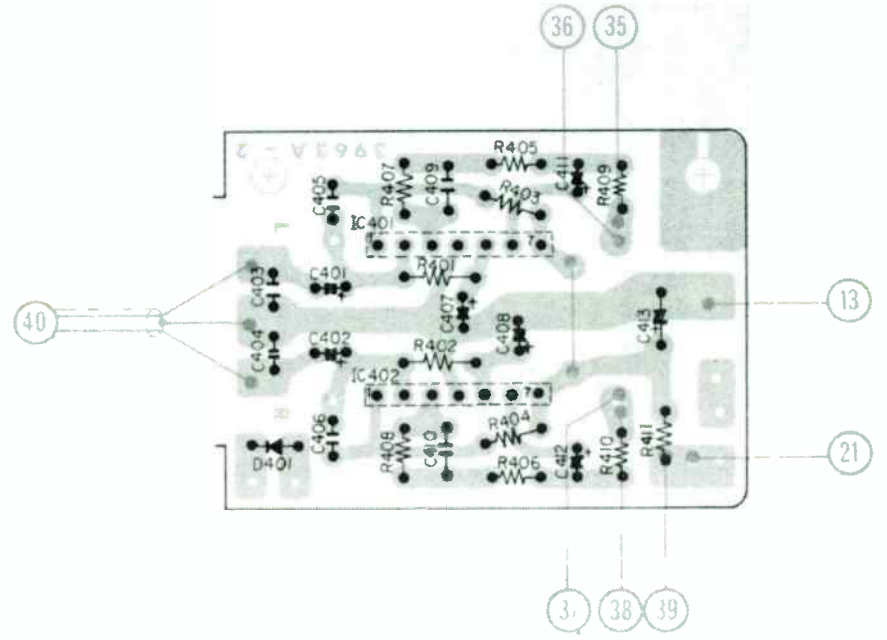
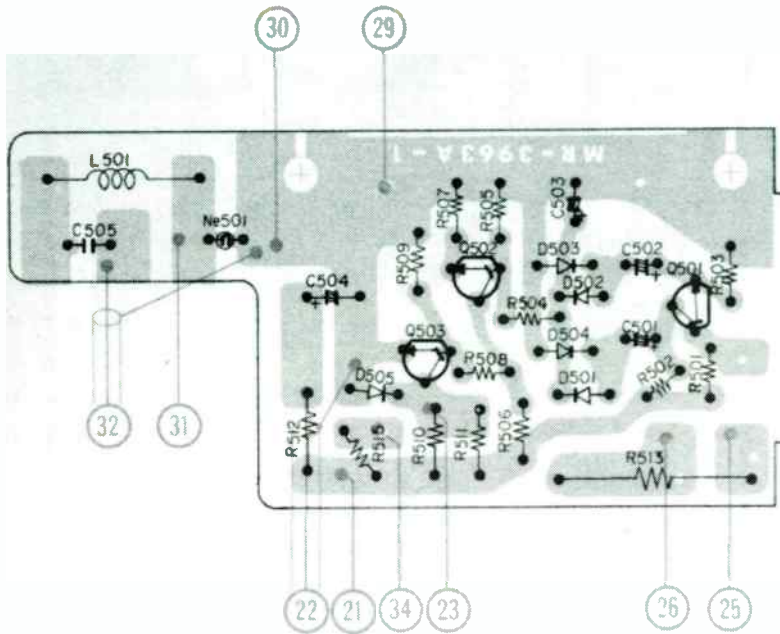
Fig. 9

ALIGNMENT LOCATION DETAIL

**Audiovox CP-750, ID-700,
GM-CXP, 77178-CXP**

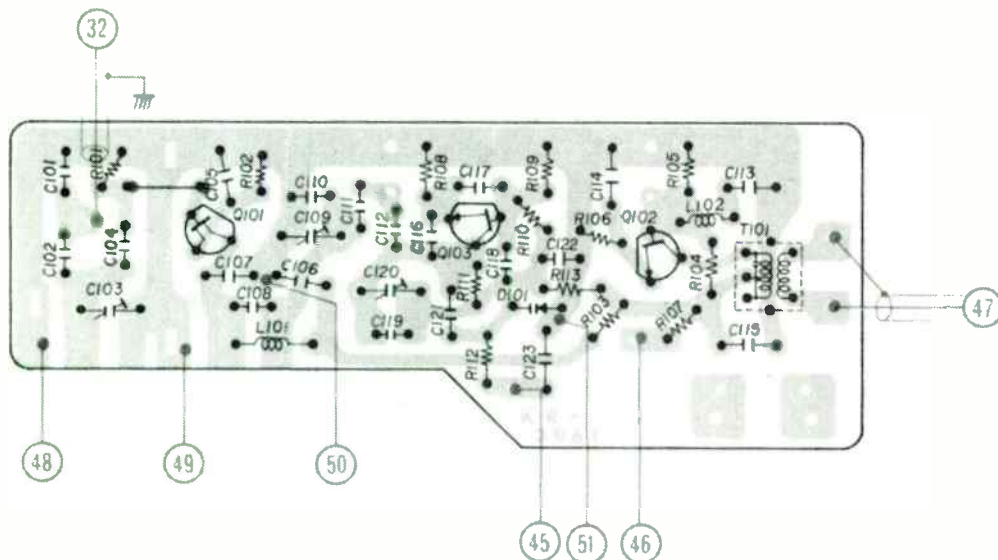
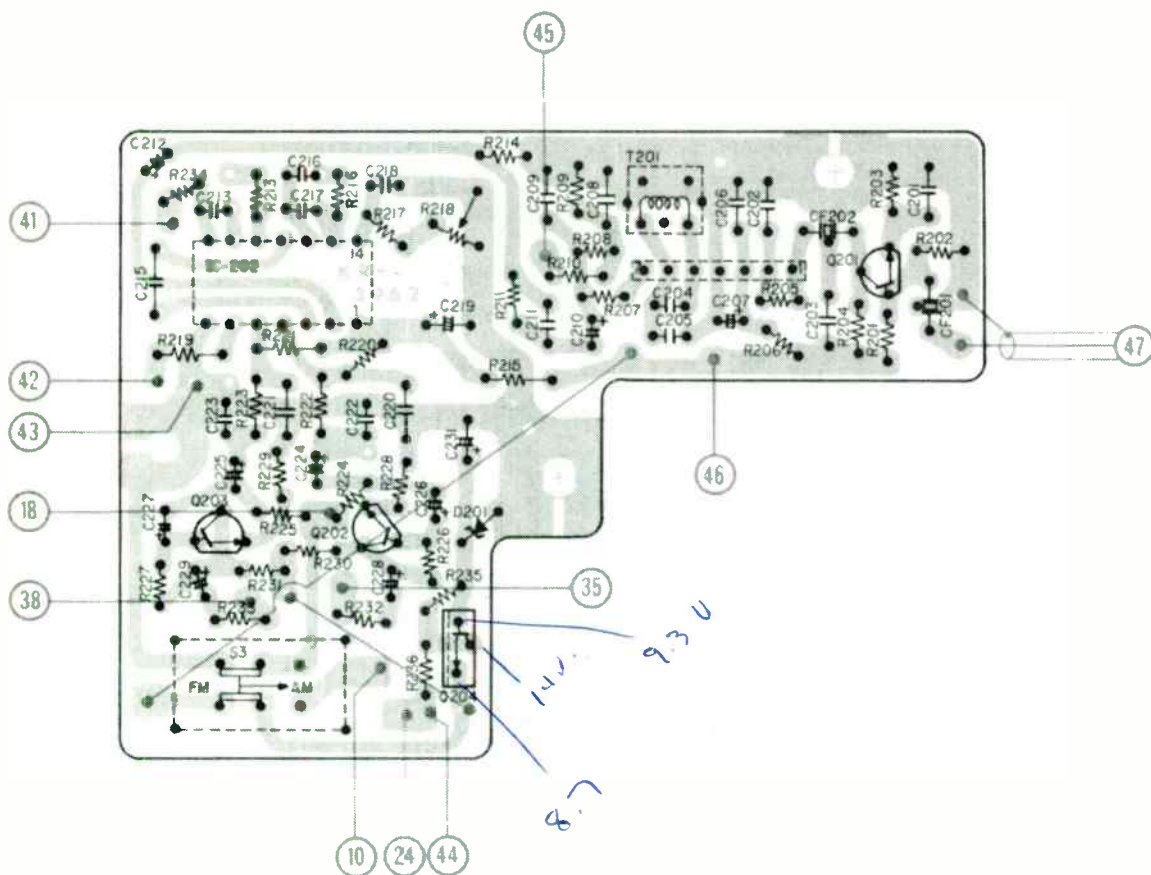


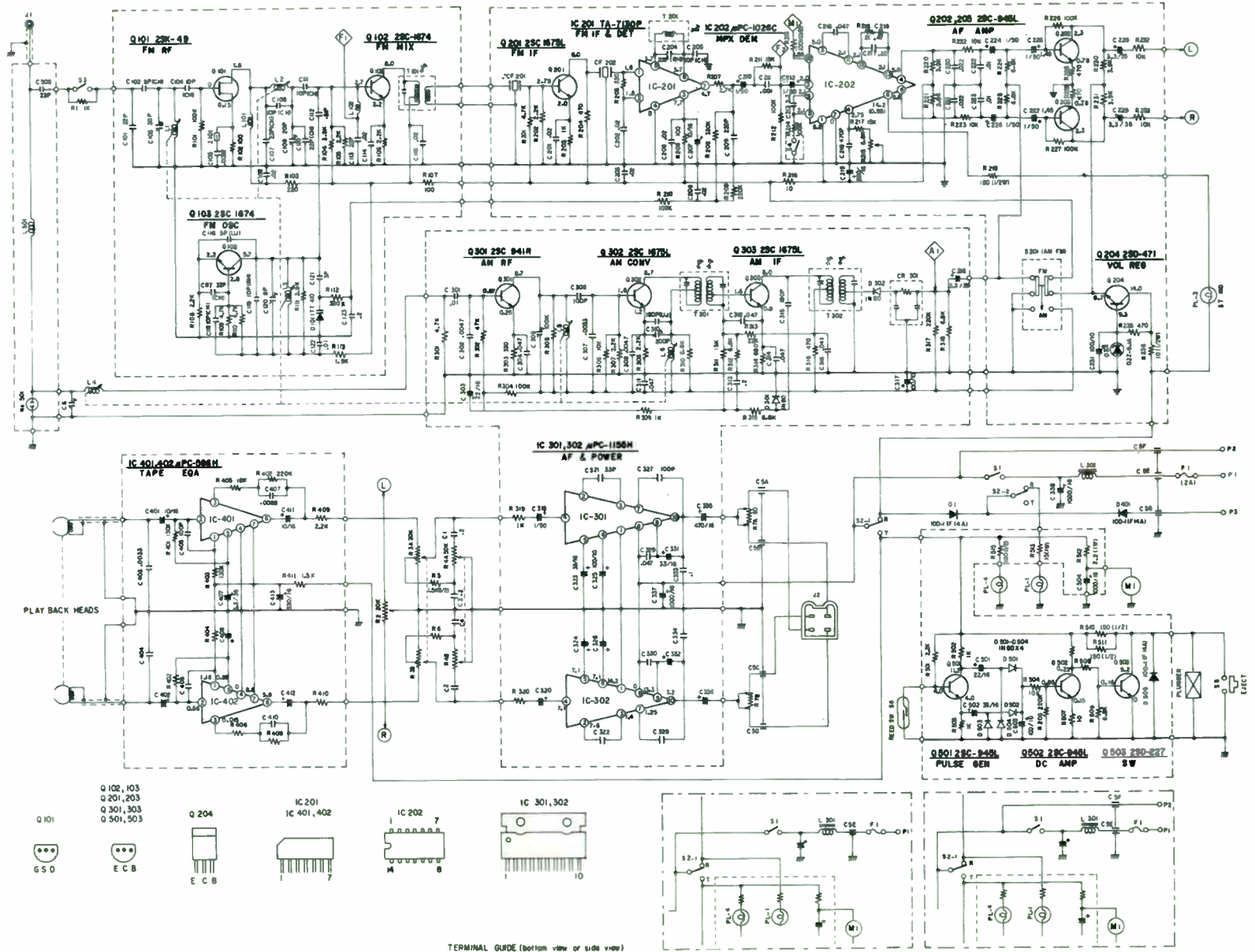
PARTS ASSEMBLY LAYOUT



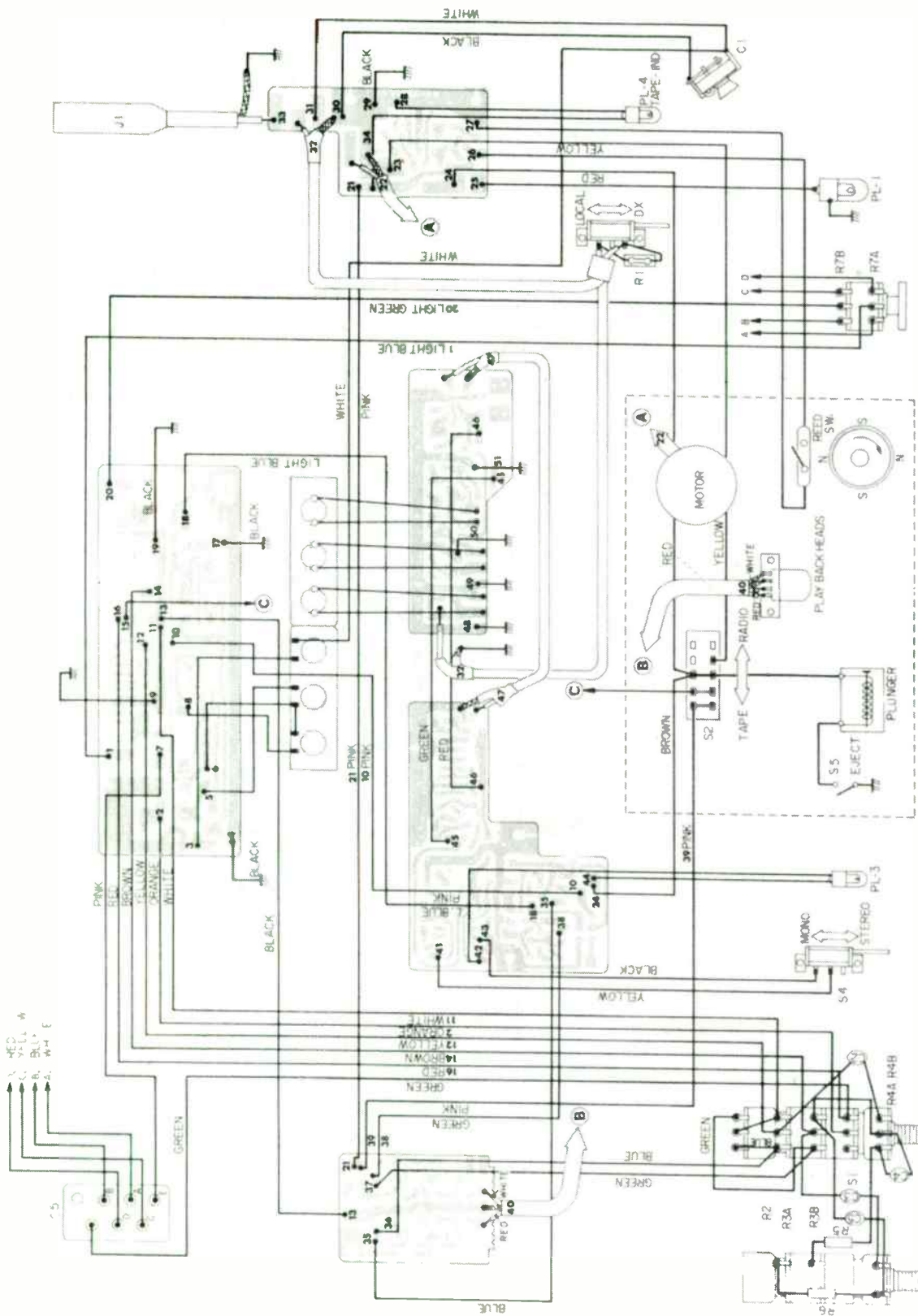
PARTS ASSEMBLY LAYOUT

Audiovox CP-750, ID-700, GM-CXP, 77178-CXP





Audiovox CP-750, ID-700, GM-CXP, 77178-CXP



Audiovox CP-750, ID-700, GM-CXP, 77178-CXP

Reference No	Part No	Description	Q'ty			Reference No	Part No	Description	Q'ty		
			CP-750 ID-700	CXPA	GM-CXP				CP-750 ID-700	CXPA	GM-CXP
ELECTRICAL PARTS						RESISTORS (Unlisted resistors are carbon type 1/4W. See schematic diagram for specific values)					
CAPACITORS (Unlisted capacitors on this parts list are Ceramic Disc Type .50V See schematic diagram for specific values)											
C-1, 2, 3, 4, 123, 313	38C-200-1	2uF, 12V, semi-conductor	6	6	6	R-1	38C-200-81	1,000, 10%, 1/4W, carbon (small size)	1	1	1
C-5A, B, C, D, E	38C-200-2	1,000PF x 5, feed-thru KC-1215	1	—	—	R-5, 6	38C-200-82	1,500, 10%, 1/2W, fixed-composition	2	2	2
C-5A, B, C, D, E, F	38C-200-3	1,000PF x 6, feed-thru KC-1206	—	1	—	R-213	38C-200-83	100,000, 10%, 1/2W, fixed-composition	1	1	1
C-5A, B, C, D, E, F, G	38C-200-4	1,000PF x 7, feed-thru KC-1207	—	—	1	R-218	38C-200-84	6,800, semi-fixed, VR-218	1	1	1
C-6	38C-200-5	120PF, max. trimmer TC-17	1	1	1	R-219, 515	38C-200-85	180, 10%, 1/2W, fixed-composition	2	2	2
C-102	38C-200-6	5PF, 50V, NPO, ceramic	1	1	1	R-236	38C-200-86	10, 10%, 1/2W, carbon	1	1	1
C-103, 109	38C-200-7	20PF, max. trimmer TC-33	2	2	2	R-510, 511	38C-200-87	150, 10%, 1/2W, fixed composition	2	2	2
C-104, 108, 111, 118, 205	38C-200-8	10PF, 50V, NPO, ceramic	5	5	5	R-512	38C-200-88	2.2, 1W, Metal film	1	1	1
C-107, 110	38C-200-9	22PF, 50V, NPO, ceramic	2	2	2	R-513	38C-200-89	15, 1W, Metal film	1	1	1
C-112	38C-200-10	51PF, 50V, fixed-composition	1	1	1	SWITCHES					
C-116	38C-200-11	5PF, 50V, N750, ceramic	1	1	1	S-2	38C-200-91	Tape/Radio SW 940-06-31	1	1	1
C-117	38C-200-12	33PF, 50V, NPO, ceramic	1	1	1	S-3	38C-200-92	Local/OX Sw SW-128-2	1	1	1
C-119	38C-200-13	10PF, 50V, N220, ceramic	1	1	1	S-4	38C-200-93	Stereo/Mono Sw SW-128	1	1	1
C-120	38C-200-14	8PF, max. trimmer TC-32	1	1	1	S-5	38C-200-94	Eject Sw MSW-0083	1	1	1
C-121	38C-200-15	3PF, 50V, NPO, ceramic	1	1	1	S-6	38C-200-95	Reed Sw Assembly 943-11-93	1	1	1
C-122, 301	38C-200-16	01uF, 50V, mylar	2	2	2	S-201	38C-200-96	AM/FM Sw SW-133	1	1	1
C-204	38-200-17	22PF, 50V, N220, ceramic	1	1	1	SEMI-CONDUCTORS					
C-207, 401, 402, 411, 412	38C-200-18	10uF, 16V, electrolytic	5	5	5	D-101	38C-200-101	Diode varr-cap ITT-410	1	1	1
C-210, 212, 224, 225, 226, 227, 319, 320	38C-200-19	1uF, 50V, electrolytic	8	8	8	D-201	38C-200-102	Diode zener 022-91A	1	1	1
C-213	38C-200-20	2.2uF, 16V, tantalum	1	1	1	0-301, 302, 501, 502, 503, 504	38C-200-103	Diode, Det & Rect IN-60	6	6	6
C-215, 311	38C-200-21	0.47uF, 50V, mylar	2	2	2	0-505	38C-200-104	Diode Spark Supp 10D-1	1	1	1
C-216	38C-200-22	47uF, 25V, tantalum	1	1	1	IC-201	38C-200-105	Integrated Circuit TA-7130	1	1	1
C-217	38C-200-23	22uF, 25V, tantalum	1	1	1	IC-202	38C-200-106	Integrated Circuit uPC-1026C	1	1	1
C-218	38C-200-24	470PF, 50V, polystyrene	1	1	1	IC-301, 302	38C-200-107	Integrated Circuit uPC-1166H	2	2	2
C-219	38C-200-25	220uF, 16V, electrolytic	1	1	1	IC-401, 402	38C-200-108	Integrated Circuit uPC-566H	2	2	3
C-220, 221	38C-200-26	0.22uF, 16V, semi-conductor	2	2	2	Q-101	38C-200-109	Transistor 2SK-49	1	1	1
C-222, 223	38C-200-27	01uF, 16V, semi-conductor	2	2	2	Q-102, 103	38C-200-110	Transistor 2SC-1674L	2	2	2
C-228, 229, 318, 407, 408	38C-200-28	33uF, 35V, electrolytic	5	5	5	Q-201, 302, 303	38C-200-111	Transistor 2SC-1675L	3	3	3
C-231, 317, 325, 326, 503	38C-200-29	100uF, 10V, electrolytic	5	5	5	Q-202, 203, 501, 502	38C-200-112	Transistor 2SC-945L	4	4	4
C-302, 308	38C-200-30	0.047uF, 50V, mylar	2	2	2	Q-204	38C-200-113	Transistor 2S0-471	1	1	1
C-303, 501	38C-200-31	22uF, 16V, electrolytic	2	2	2	Q-301	38C-200-114	Transistor 2SC-941R	1	1	1
C-304, 312, 314, 316, 329, 330	38C-200-32	0.47uF, 16V, semi-conductor	6	6	6	Q-503	38C-200-115	Transistor 2SD-227	1	1	1
C-305	38C-200-33	70PF, max. trimmer TC-42	1	1	1	TRANSFORMERS					
C-307, 493, 404, 403	38C-200-34	0.033uF, 50V, mylar	3	3	3	T-101	38C-200-121	FM IFT IT-830B-1	1	1	1
C-309	38C-200-35	180PF, 50V, N750, ceramic	1	1	1	T-201	38C-200-122	FM IFT IT-7130	1	1	1
C-310	38C-200-36	200PF, max. trimmer TC-19	1	1	1	T-301	38C-200-123	AM IFT IT-808A	1	1	1
C-323, 324, 331, 332, 502	38C-200-37	33uF, 16V, electrolytic	5	5	5	T-302	38C-200-124	AM IFT IT-218B-1	1	1	1
C-333, 334	38C-200-38	1uF, 50V, mylar	2	2	2	MECHANICAL PARTS					
C-335, 336	38C-200-39	470uF, 16V, electrolytic	2	2	2	38C-200-131	Background dial KR-14620	1	1	1	
C-337, 338, 504	38C-200-40	1,000uF, 16V, electrolytic	3	3	3	38C-200-132	Bracket antenna trimmer KR-14884	1	1	1	
C-409, 410	38C-200-41	0.068uF, 50V, mylar	2	2	2	38C-200-133	Bracket deck KR-14758	2	2	2	
C-413	38C-200-42	330uF, 16V, electrolytic	1	1	1	38C-200-134	Bracket local/dx switch KR-14755	1	1	1	
COILS & CHOKES						38C-200-135	Bracket, pc board KR-14621	1	1	1	
L-1, 2, 3, 4, 5, 6	38C-200-51	Tuner Assembly CT-8088	1	1	1	38C-200-136	Bracket stereo/mono switch KR-14619	1	1	1	
L-101	38C-200-52	Choke, RF LH-2.2	1	1	1	38C-200-137	Bracket, top cover KR-14759	1	1	1	
L-102	38C-200-53	Coil, IF Trap FL-1 D	1	1	1	38C-200-138	Cable Ass'y, battery & speaker cord QS-763	1	—	—	
L-301	38C-200-54	Choke, DC NL-6	1	1	1	38C-200-139	Cable Ass'y, battery & speaker cord QS-773	—	1	—	
L-501	38C-200-55	Choke, ANT SL-4.7	1	1	1	38C-200-140	Cable Ass'y, battery & speaker cord QS-708	—	—	1	
CONTROLS						38C-200-141	Chassis, base PR-14754C	1	1	1	
R-2, 3A, B, 4A, B, S-1	38C-200-61	Volume Tone & Balance L/R, On-Off Sw VR-289	1	1	1	38C-200-142	Chassis, front MR-14760C	1	1	1	
R-7A, B	38C-200-62	Balance F/R VR-234	1	1	1	38C-200-143	Cover, bottom MR-14768	1	1	1	
MISCELLANEOUS						38C-200-144	Cover, top MR-14767	1	1	1	
CF-201, 202	38C-200-71	Ceramic Filter SFE-107MA-5	2	2	2	38C-200-145	Dog-washer, volume & tuning shaft KR-12549	2	2	—	
CR-301	38C-200-72	CR component SM-02	1	1	1	38C-200-146	Dog-washer, volume & tuning shaft KR-14374	—	—	2	
F-1	38C-200-73	Fuse 2A	1	1	1	38C-200-147	Escutcheon Ass'y, with band selector knob & dial plate 38C-200	1	—	—	
H-1	38B-200-74	Play Back Head 940-03-06	1	1	1	38C-200-148	Escutcheon Ass'y with band selector knob & dial plate 38C-202	—	1	—	
M-1	38C-200-75	Motor MMS-3NF2M	1	1	1	38C-200-149	Escutcheon Ass'y with band selector knob & dial plate 38C-201	—	—	1	
Ne-501	38C-200-76	Neon Bulb NE-2	1	1	1						
PL-1	38C-200-77	Lamp pilot PL-1B	1	1	1						
PL-3, 4	38C-200-78	Lamp stereo & tape indicator PL-15	1	1	1						
Z-101	38C-200-79	Ferrite Bead FB-202	1	1	1						

Reference No	Part No	Description	Q'ty			Reference No	Part No	Description	Q'ty			
			CP-750 ID-700	CXPA	GM-CXP				CP-750 ID-700	CXPA	GM-CXP	
	38C-200-150	Heatsink power IC KR-14756	1	1	1		38C-200-223	Plate Ass'y head rest 943-03-81	1	1	1	
	38C-200-151	Holder pilot lamp PLH-26	1	1	1		38C-200-224	Pulley motor (with screw) 940-12-05	1	1	1	
	38C-200-152	Holder stereo indicator lamp KR-30988	1	1	1		38C-200-225	Shaft Pinch roller 940-04-02	1	1	1	
	38C-200-153	Holder tape indicator lamp KR-30956A	1	1	1		38C-200-226	Solenoid Ass'y 940-05-81	1	1	1	
	38C-200-154	Knob FF/Eject/Rewind KN-229T	1	1	1		38C-200-227	Spacer feed reel plate 940-08-03	1	1	1	
	38C-200-155	Knob Local/DX KN-231TA	1	—	1		38C-200-228	Spacer ff plate 940-09-03	1	1	1	
	38C-200-156	Knob Local/DX KN-231TCRA	—	1	—		38C-200-229	Spacer ff/rewind lock plate 943-09-08	1	1	1	
	38C-200-157	Knob stereo/mono KN-230TA	1	—	1		38C-200-230	Spacer head 940-03-07	1	1	1	
	38C-200-158	Knob stereo/mono KN-230TCRA	—	1	—		38C-200-231	Spacer head rest plate 940-03-05	1	1	1	
	38C-200-159	Lever band selector switch KR-14769	1	1	1		38C-200-232	Spacer rewind lever 940-09-06	1	1	1	
	38C-200-160	Lever local/dx switch KR-14791	1	1	1		38C-200-233	Spring cartridge retaining 940-01-05	1	1	1	
	38C-200-161	Lever stereo/mono switch KR-14792	1	1	1		38C-200-234	Spring deck chassis lift 238-04-06	1	1	1	
	38C-200-162	Linkage band selector switch MR-14623	1	1	1		38C-200-235	Spring feed/take-up reel 05-05-02	2	2	2	
	38C-200-163	Nut volume & tuning shaft N3/8" 3t	2	2	4		38C-200-236	Spring ff plate 395-15-02	1	1	1	
	38C-200-164	P C Board EQA MR-3963-1	1	1	1		38C-200-237	Spring head 328-05-09	1	1	1	
	38C-200-165	P C Board AM power MR-3960	1	1	1		38C-200-238	Spring head rest plate 238-03-10	1	1	1	
	38C-200-166	P C Board FQA MR-3963-2	1	1	1		38C-200-239	Spring head rest plate retaining 940-03-10	1	1	1	
	38C-200-167	P C Board front end KR-3961	1	1	1		38C-200-240	Spring lift lever 18-06-06	1	1	1	
	38C-200-168	P C Board MPX KR-3962	1	1	1		38C-200-241	Spring pinch roller 940-04-01	1	1	1	
	38C-200-169	Plate power IC retaining KR-14757	2	2	2		38C-200-242	Spring take-up arm 940-10-03	1	1	1	
	38C-200-170	Plate shield KR-14848	1	1	1		38C-200-243	Take up Arm Ass'y 940-10-81	1	1	1	
	38C-200-171	Pointer dial KR-14846	1	1	1		38C-200-244	Take up Reel Ass'y 943-11-91	1	1	1	
	38C-200-172	Receptacle antenna AJ-12	1	1	1		38C-200-245	Washer flywheel 430-13-11	1	1	1	
	38C-200-173	Reflector pilot lamp KR-14904	1	1	1		38C-200-246	Washer reel retaining 192-06-02A	1	1	1	
	38C-200-174	Retainer antenna receptacle KR-12285	1	1	1							
	38C-200-175	Retainer battery & speaker cord KR-13769	1	1	1		INSTALLATION & ACCESSORY MODEL CP-750					Q'ty
	38C-200-176	Screw machine P B 3 x 4	5	5	5		38C-200-251	Back up plate MR-12200A			1	
	38C-200-177	Screw machine P B 3 x 8	2	2	2		38C-200-252	Collar escutcheon KR-14874			1	
	38C-200-178	Screw machine P B 3 x 6	8	8	8		38C-200-253	Fuse 2A			1	
	38C-200-179	Screw machine P B 2 x 4 (stereo/mono local/dx sw)	5	5	5		38C-200-254	Insert KR-13109			2	
	38C-200-180	Screw machine P B 2 x 3 (ff/eject knob)	1	1	1		38C-200-255	Knob tone & balance KN61TCR			2	
	38C-200-181	Screw machine P B 3 x 6 (BS) (heatsink)	2	2	2		38C-200-256	Knob volume & tuning KN-54VCR			2	
	38C-200-182	Screw tapping hex 3 x 6	22	22	22		38C-200-257	Owner's Guide 38C-200C (01)			1	
	38C-200-183	Screw tapping P B 3 x 8	4	4	4		38C-200-258	Rear Support Strap KR-1011			1	
	38C-200-184	Screw tapping P B 3 x 6	14	14	14		38C-200-259	Screw Bag 38C-200C (01)			1	
	38C-200-185	Shaft Ass'y tuning & balance TSA-25	1	1	1		38C-200-260	Speaker Cord QS-672			1	
	38C-200-186	Spacer band selector lever KR-13358A	1	1	1		38C-200-261	Trimplate MR-14950			1	
	38C-200-187	Sticker model no 38C-200C2 (ID-700)	1	—	—		INSTALLATION & ACCESSORY MODEL 77-CXPA/78-CXP					
	38C-200-188	Sticker model no 38C-200C3 (77-CXPA/78-CXP)	—	1	—		38C-200-271	Collar escutcheon KR-14874			1	
	38C-200-189	Sticker model no 38C-200C (CP-750)	1	—	—		38C-200-272	Owner's Guide 38C-202C (03)			1	
	38C-200-190	Sticker model no 38C-201C (GM-CXP)	—	—	1		38C-200-273	Rear Support Strap KR-1011			1	
	38C-200-191	Washer lock LW-9	2	2	2		38C-200-274	Screw Bag 38C-202C (03)			1	
	38C-200-192	Washer volume & tuning shaft KR-13853	—	—	2		38C-200-275	Spacer 27/32" KR-14418 (106A 106B)			1	
							38C-200-276	Spacer 5/8" KR-14419 (106A-1074)			1	
							38C-200-277	Spacer 9/32" KR-14417 (106A-1075)			1	
							INSTALLATION & ACCESSORY MODEL ID-700					
							38C-200-281	"A" Lead Adaptor Bag QS-579			1	
							38C-200-282	Back up Plate MR-12200A			1	
							38C-200-283	Collar escutcheon KR-14874			1	
							38C-200-284	Fuse 2A			2	
							38C-200-285	Insert KR-13109			2	
							38C-200-286	Knob Bag (No 1) KN-73T (shallow)			1	
							38C-200-287	Knob Bag (No 2) KN-61T (deep)			1	
							38C-200-288	Knob Bag (No 3) KN-54V (front)			1	
							38C-200-289	Owner's Guide 38C-200C (02)			1	
							38C-200-290	Rear Support Strap KR-1011			1	
							38C-200-291	Screw Bag 38C-200 (02)			1	
							38C-200-292	Spacer Bag S-099			1	
							38C-200-293	Speaker Cord QS-672			1	
							38C-200-294	Trimplate MR-14950			1	
							38C-200-295	Wire Nut Bag S-100			1	
							INSTALLATION ACCESSORY MODEL GM-CXP					
							38C-200-301	Owner's Guide 38C-201C (03)			1	
							38C-200-302	Rear Support Strap KR-1011			1	
							38C-200-303	Screw Bag 38C-201C (03)			1	
	38C-200-201	Arm deck chassis joint 940-13-06	4	4	4							
	38C-200-202	Arm (L) eject 430-33-01	1	1	1							
	38C-200-203	Arm (R) eject 430-32-01	1	1	1							
	38C-200-204	Bearing flywheel 1085-12-01	1	1	1							
	38C-200-205	Belt flywheel drive 940-12-06	1	1	1							
	38C-200-206	Bracket flywheel 940-12-03	1	1	1							
	38C-200-207	Bracket tape/radio switch 940-06-01	1	1	1							
	38C-200-208	Chassis Ass'y (main) 945-01-91	1	1	1							
	38C-200-209	Chassis Ass'y (sub) 940-07-91	1	1	1							
	38C-200-210	Feed Reel Ass'y 940-11-92	1	1	1							
	38C-200-211	Flywheel 940-12-91	1	1	1							
	38C-200-212	Guide(L) cartridge 940-01-93	1	1	1							
	38C-200-213	Guide(R) cartridge 940-01-92	1	1	1							
	38C-200-214	Lever Ass'y rewind 940-09-92	1	1	1							
	38C-200-215	Lever deck chassis lift 940-13-81	1	1	1							
	38C-200-216	Lever ff/eject/rewind 945-02-81	1	1	1							
	38C-200-217	Lever lock 940-02-91	1	1	1							
	38C-200-218	Lever tape/radio switch 940-02-06	1	1	1							
	38C-200-219	Pinch Roller Ass'y 430-31-00	1	1	1							
	38C-200-220	Plate Ass'y feed reel 940-08-91	1	1	1							
	38C-200-221	Plate ff 940-09-01	1	1	1							
	38C-200-220	Plate Ass'y ff/rewind lock 943-09-93	1	1	1							

REPLACEMENT PARTS LIST AM/FM MULTIPLEX RADIO (P/N 4048370/4048142)

Ref. No.	Part Number	Description	Suggested Price
		<u>MISCELLANEOUS PARTS</u>	
226	3598487**	Escutcheon Assy (G.I.)	
227	3598488**	Escutcheon Assy (TRW)	
228	3598482**	Sub-Escutcheon Assembly	
229	3598485**	Diffuser	
230	9436790**	Lamp, Stereo #73	
231	131282**	Lamp, Radio	

* Used in the 4048370 Radio.

** Used in the 4048142 Radio.

A. AM ALIGNMENT PROCEDURE

A 3.2 ohm speaker or a 3.2 ohm, 10 watt resistive load must be connected across the receiver speaker leads during alignment. Connect an audio output meter across the output load. Connect a signal generator through a dummy antenna to the receiver antenna receptacle, see Figure 3. With the fader control adjusted to maximum resistance, slowly increase the signal generator output from zero to a level to maintain 1.80 volts (1 watt) on the audio output meter to prevent overloading. The power source voltage should be 13.2 volts. With the top and bottom covers installed, perform the following steps for AM alignment. IF alignment is purposely excluded because the FM printed circuit board must be removed to tune the IF transformers on the radio. These transformers are pre-tuned at the factory. The antenna trimmer, C1, is located at the right rear corner of the radio.

Step	Test Signal Connection	Test Signal Freq. (400 Hz Mod.)	Tuner Set To	Adjust for Max. Output in Order Shown
RF ALIGNMENT				
1.	Antenna recept. through dummy antenna, see Figure 3.	1620 KHz	Hi-end Stop	C2B, C1, C2A, see Figure 4 & 5
<p style="text-align: center;"><u>NOTE</u></p> <p style="text-align: center;">DO NOT PERFORM STEPS 3, 4, 5, AND 6 UNLESS TUNER HAS BEEN TAMPERED WITH OR COMPONENTS HAVE BEEN REPLACED. BEFORE PROCEEDING WITH STEP 3, BACK TUNING CORES OUT OF TUNIG COILS TO WHERE THEY JUST REMAIN IN COIL FORM, TO ELIMINATE THEIR EFFECT ON TRIMMER ADJUSTMENT.</p>				
2.	Antenna recept. through dummy antenna, see Figure 3.	1620 KHz	Hi-end Stop	C2B, C1, C2A, see Figure 4 & 5
3.	Antenna recept. through dummy antenna, see Figure 3.	1000 KHz	1000 KHz	L4, L3, L2
4.	Antenna recept. through dummy antenna, see Figure 3.	1620 KHz	Hi-end Stop	C2B, C1, C2A, see Figure 4 & 5
5.	Repeat steps 3 and 4 until no further increase, then cement cores in place; last adjustment should be step 4.			
ANTENNA TRIMMER				
6.	With radio installed and antenna fully extended, tune receiver to a weak station at approximately 1600 KHz. Adjust the antenna trimmer, C1, for maximum signal volume.			

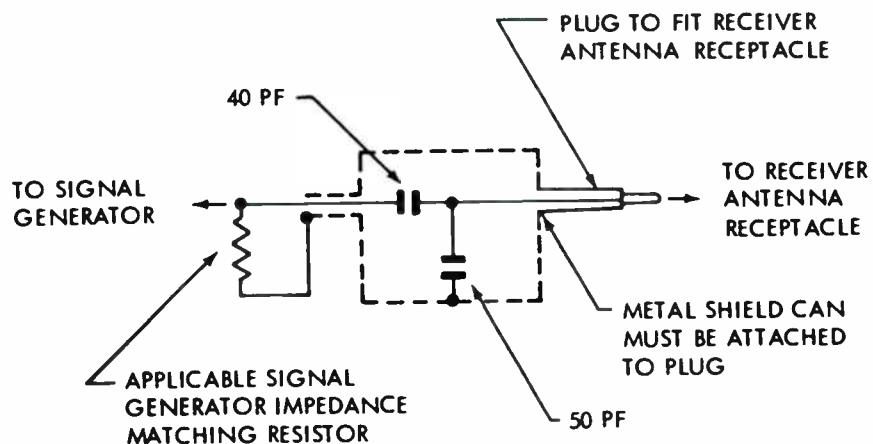


Figure 3. AM Dummy Antenna Detail

B. FM ALIGNMENT PROCEDURE

With the fader control adjusted to maximum resistance, a 3.2 ohm speaker or a 3.2 ohm, 10 watt resistive load must be connected across the receiver speaker leads during alignment. Connect the generator through a dummy antenna to the receiver antenna receptacle, see Figure 6. Except for L106 adjustment, use only enough generator output to provide a usable indication. For L106 adjustment use enough signal for a conveniently noise free display. To gain access to the tuner slugs, the lens assembly and backdial must be removed. The lens assembly may be held in place to locate frequency dial settings. With the bottom cover installed, perform the following steps for FM alignment; see Figure 4 and 5.

FM ALIGNMENT PROCEDURE				
Step	Test Signal Connection	Test Equipment	Monitor Point	Adjustment
1.				Adjust receiver dial to 108.0 MHz and set a pushbutton to this frequency.
2.	Antenna recept. through dummy antenna, see Figure 6.	Sweep Gen. with 108 MHz Marker and Oscilloscope	Junction R124 & C123	Adjust L106 for oscilloscope display as shown in Figure 7. Adjust C128 for center of "S" curve at 108.0 MHz. Adjust C128, C127, C126 and T101 for maximum peak to peak output (below receiver limiting level)
3.	Antenna recept. through dummy antenna, see Figure 6.	Signal Gen. tuned to 108.0 MHz with 400 Hz. Modulation (22.5 KHz deviation)	Across Speaker Voice Coil	Adjust C128, C127, C126 and T101 for maximum Audio output (below receiver limiting level)
<p><u>NOTE</u></p> <p>DO NOT PERFORM STEPS 4 AND 5 UNLESS TUNER HAS BEEN TAMPERED WITH OR COMPONENTS HAVE BEEN REPLACED. BEFORE PROCEEDING WITH STEP 4, BACK TUNING CORES OUT OF TUNING COILS TO WHERE THEY JUST REMAIN IN COIL FORM, TO ELIMINATE THEIR EFFECT ON TRIMMER ADJUSTMENT. REPEAT STEPS 1, 2, 3, (C128, C127 AND C126 ADJUSTEMENT ONLY).</p>				
4.				Adjust receiver dial to 98.0 MHz and set a pushbutton to this frequency.

Step	Test Signal Connection	Test Equipment	Monitor Point	Adjustment
5.	Antenna recept. through dummy, see Figure 6.	Signal Gen. tuned to 98.0 MHz with 400 Hz Modulation (22.5 KHz deviation)	Across Speaker Voice Coil	Adjust oscillator, RF, and antenna coil slugs for maximum audio output (below receiver limiting level).
6.	Repeat steps 3 and 5, using the previously set pushbuttons set at 108 and 98 MHz., until no further increase. Cement cores in place. The last adjustment should be step 3.			
STEREO COIL				
Connect a frequency counter through a 56K ohm series resistor to the monitor test point. Short C140 to ground.				
1.		Freq. Counter (Tuned to 76 KHz)	Junction of C131, L108 of Pin 15 of I.C.	Adjust L108 for 76 KHz by peaking the output.

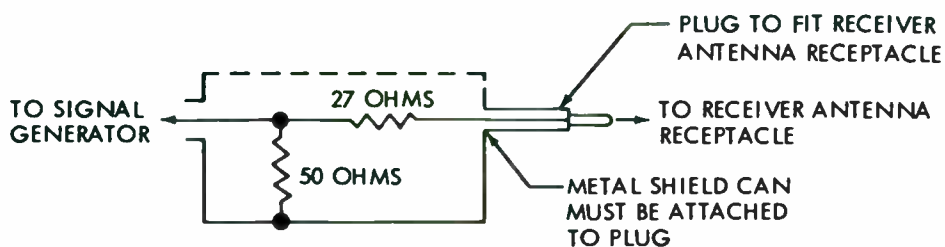


Figure 6. FM Dummy Antenna Detail

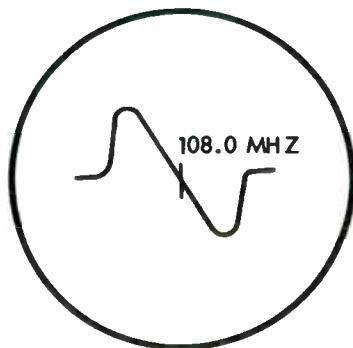


Figure 7. FM Detector "S" Curve

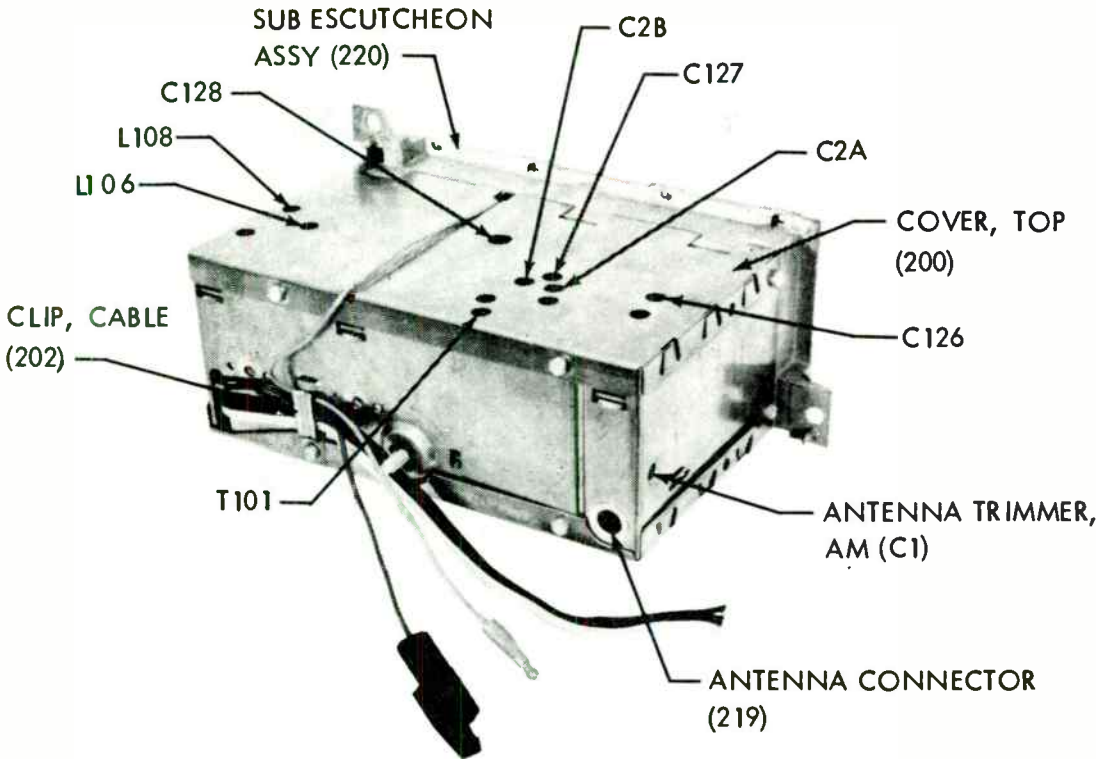


Figure 4. Alignment Locations, Bottom View (P/N 4048370)

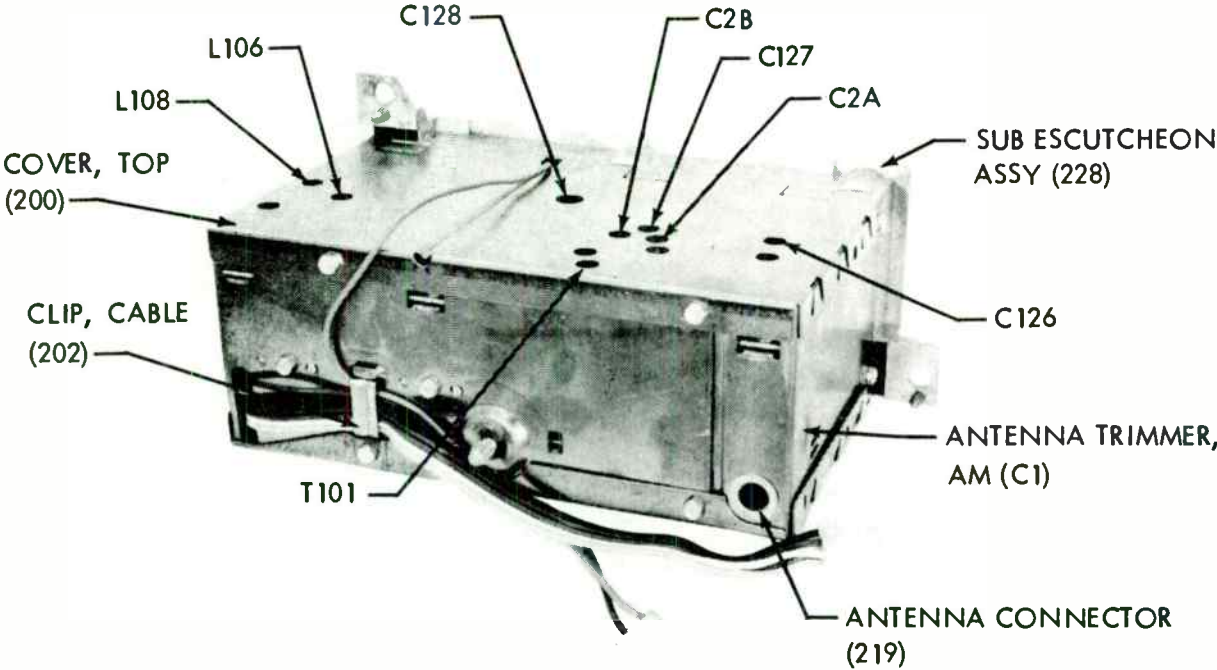
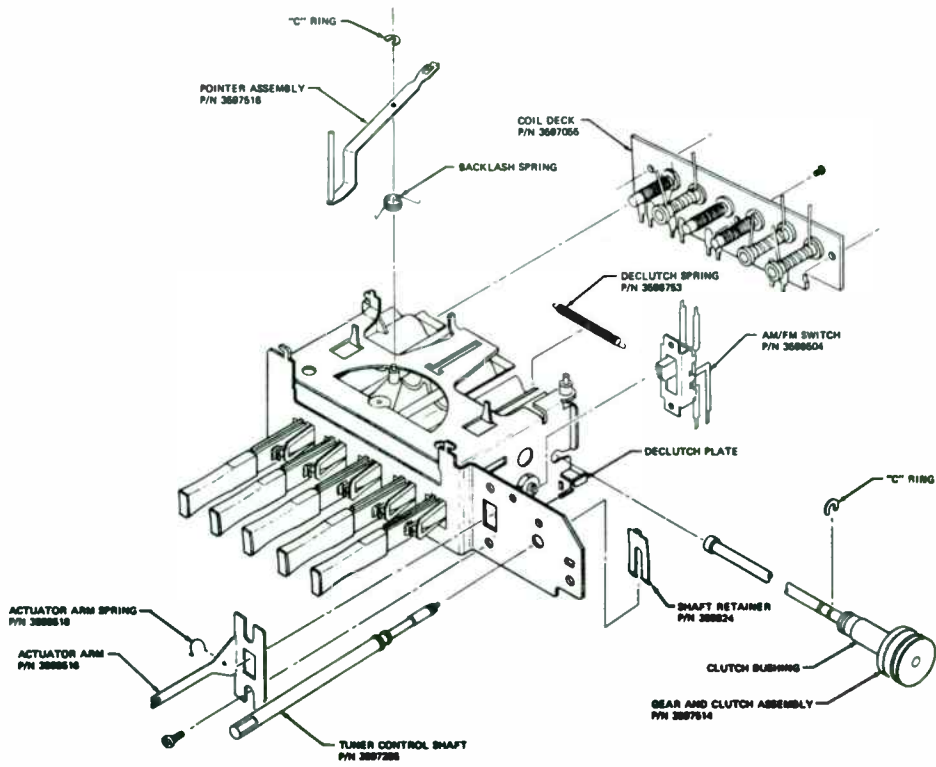
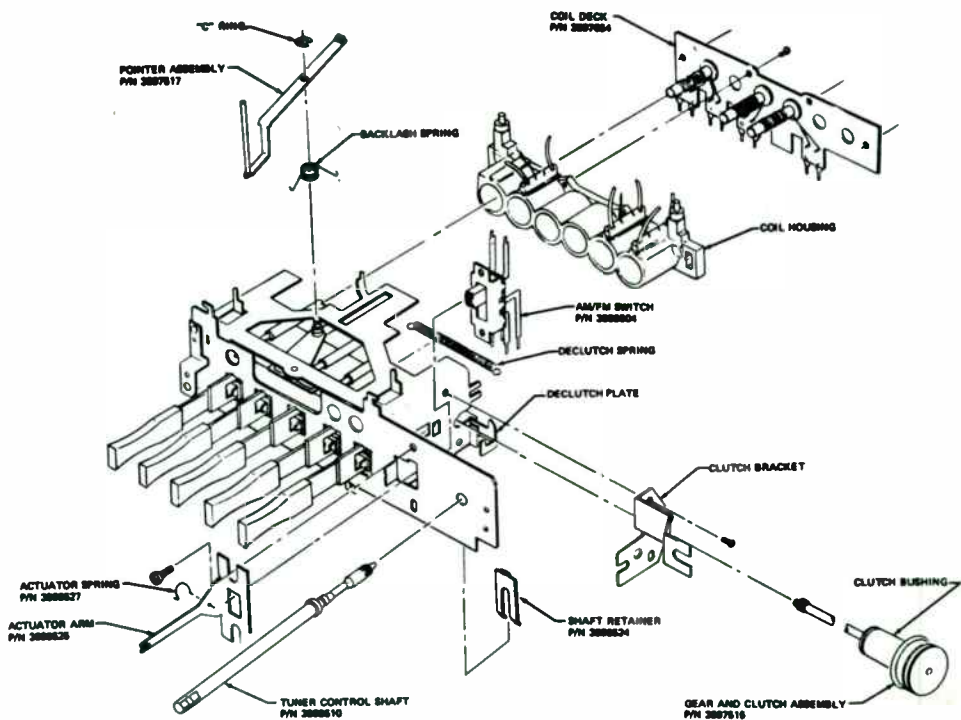


Figure 5. Alignment Locations, Bottom View (P/N 4048142)



Tuner-Exploded View (TRW)



Tuner-Exploded View (GI)

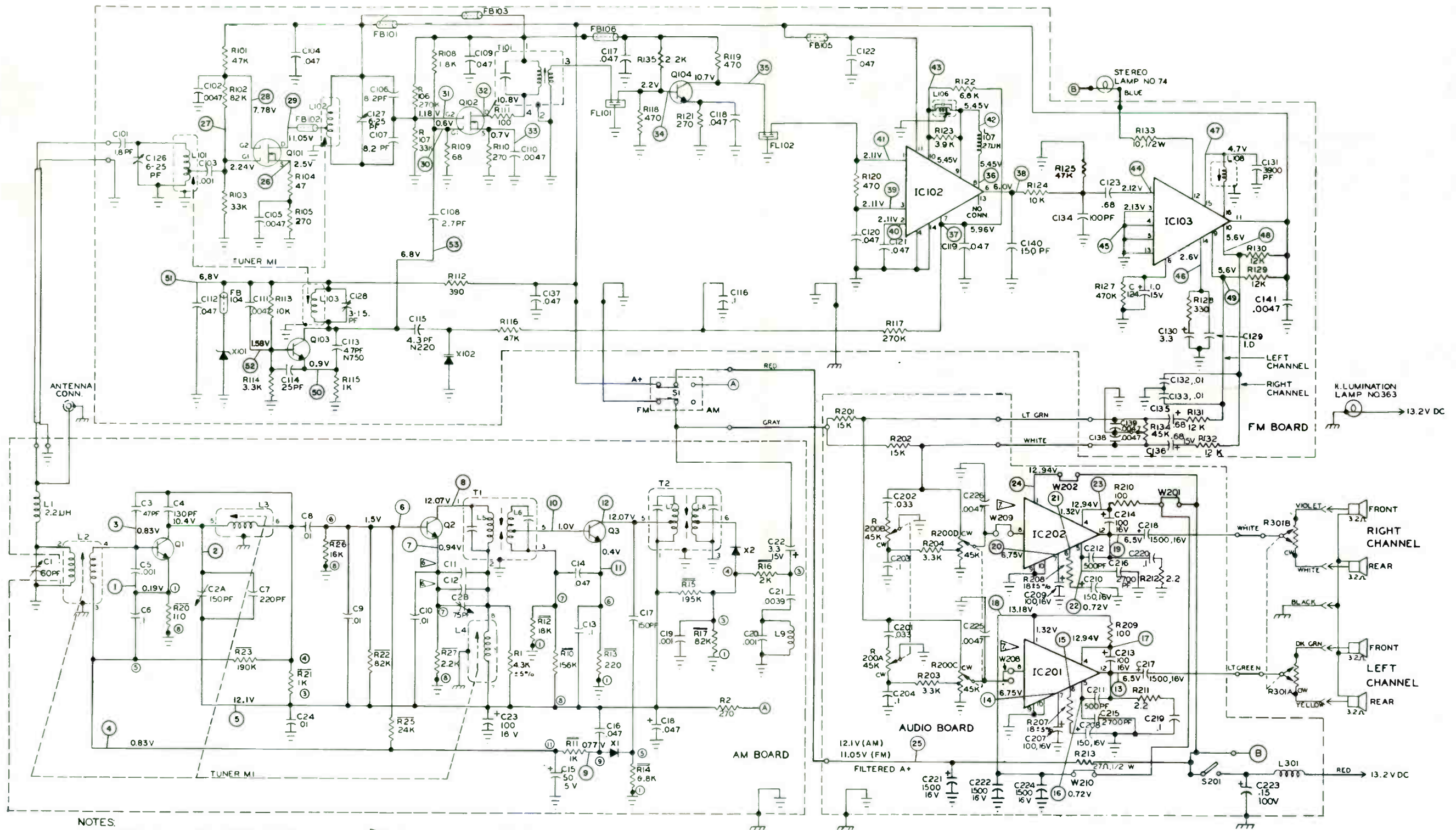
Chrysler 4048142,4048370

REPLACEMENT PARTS LIST AM/FM MULTIPLEX RADIO (P/N 4048370/4048142)

Ref. No.	Part Number	Description	Suggested Price
DIODES, TRANSISTORS, AND IC'S <u>(AM AUDIO BOARD ASSEMBLY P/N 3598574)</u>			
X1	3596061	Diode, Silicon	
X2	3596062	Diode, Germanium	
Q1	3596067	Transistor, NPN, Silicon, T0-98	
Q1	3596070	Transistor, NPN, Silicon, T0-92	
Q2	3596068	Transistor, NPN, Silicon, T0-98	
Q2	3596071	Transistor, NPN, Silicon, T0-92	
Q3	3597103	Transistor, NPN, Silicon, T0-98	
Q3	3597104	Transistor, NPN, Silicon, T0-92	
IC201	3597049	I.C., Audio Output	
IC201	3598173	I.C., Audio Output	
IC201	3597280	I.C., Audio Output	
IC202	3597049	I.C., Audio Output	
IC202	3598173	I.C., Audio Output	
IC202	3597280	I.C., Audio Output	
DIODES, TRANSISTORS AND IC'S <u>(FM BOARD ASSEMBLY P/N 3598329)</u>			
X101	3596398	Diode, Zener	
X102	3596435	Diode, VVC	
Q101	3596401	Transistor, MOSFET, RF	
Q102	3596402	Transistor, MOSFET, Mixer	
Q103	3597260	Transistor, FM Oscillator	
Q103	3597261	Transistor, FM Oscillator	
Q104	3597260	Transistor, FM IF Amplifier	
Q104	3597261	Transistor, FM IF Amplifier	
IC102	3596810	I.C., FM IF System	
IC103	3596809	I.C., Stereo MPX Decoder	
TRANSFORMERS AND COILS <u>(AM AUDIO BOARD ASSEMBLY P/N 3598574)</u>			
T1	3596804	Transformer, IF Input	
T2	3596805	Transformer, IF Output	
L1	3596331	Coil, RF	
L9	3596247	Inductor, Audio Filter	
TRANSFORMERS, COILS AND FILTERS <u>(FM BOARD ASSEMBLY P/N 3598329)</u>			
T101	3596400	Transformer, IF Input	
L106	3596807	FM Detector Coil	
L107	3597235	Choke, 27 uH	
L108	3596806	Stereo Oscillator	
FB101	3596355	Ferrite Bead	
FB102	3596355	Ferrite Bead	
FB103	3596355	Ferrite Bead	
FB104	3596355	Ferrite Bead	
FB105	3596355	Ferrite Bead	

REPLACEMENT PARTS LIST AM/FM MULTIPLEX RADIO (P/N 4048370/4048142)

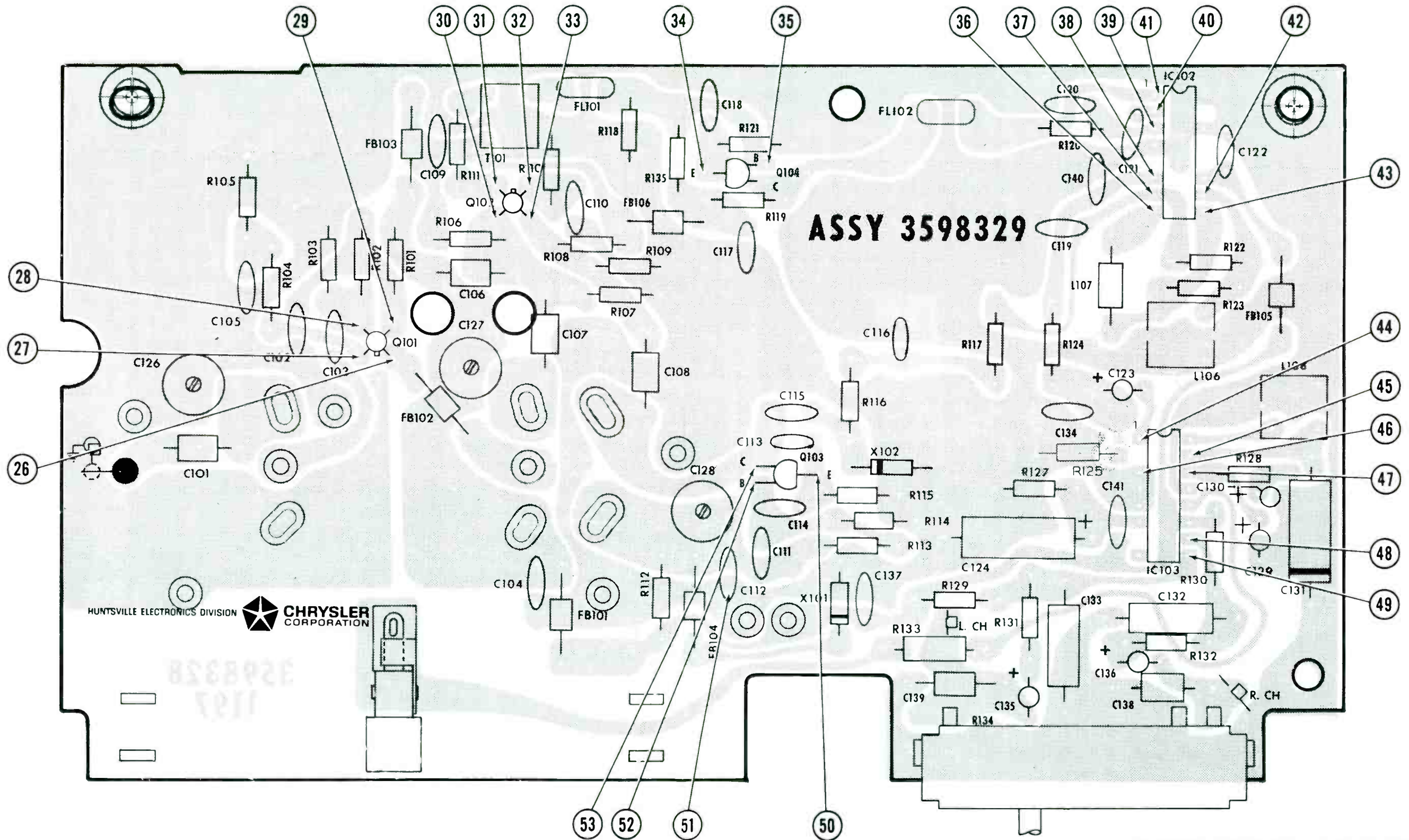
Ref. No.	Part Number	Description	Suggested Price
		<u>TRANSFORMERS, COILS AND FILTERS</u> <u>(FM BOARD ASSEMBLY P/N 3598329)</u>	
FB106	3596355	Ferrite Bead	
FL101	3598430	Filter, 10.7 MHz	
FL101	3597298	Filter, 10.7 MHz	
FL102	3598430	Filter, 10.7 MHz	
FL102	3597298	Filter, 10.7 MHz	
		(FL101 and FL102, Match Color Dots and Vendors)	
		<u>FILTER</u> <u>(CHASSIS, SIDE-BACK ASSEMBLY P/N 3596780)</u>	
L301	3598572	Supply Filter Assembly	
		<u>CAPACITORS</u> <u>(AM AUDIO BOARD ASSEMBLY P/N 3598574)</u>	
C1	3596332	Antenna Trimmer	
C2	3596333	OSC/RF Trimmer	
C3	3596137	Capacitor, Disc, 47 PF	
C4	3597296	Capacitor, Disc, 130 PF	
C5	3596138	Capacitor, Disc, .001 MF	
C6	3596889	Capacitor, Disc, 0.1 MF	
C7	3596237	Capacitor, Disc, 220 PF, N470	
C8	3596083	Capacitor, Disc, .01 MF	
C9	3596083	Capacitor, Disc, .01 MF	
C10	3596083	Capacitor, Disc, .01 MF	
C11	3597296	Capacitor, Disc, 130 PF (TRW Tuner)	
C11	3596439	Capacitor, Mica, 390 PF (GI Tuner)	
C12	3597507	Capacitor, Disc, 240 PF (TRW Tuner)	
C13	3597380	Capacitor, Disc, 0.1 MF	
C14	3597089	Capacitor, Disc, .047 MF	
C15	3596823	Capacitor, Electrolytic, 50 MF, 5V	
C16	3596089	Capacitor, Disc, .047 MF	
C17	3596125	Capacitor, Disc, 150 PF	
C18	3596089	Capacitor, Disc, .047 MF	
C19	3596138	Capacitor, Disc, .001 MF	
C20	3596138	Capacitor, Disc, .001 MF	
C21	3596419	Capacitor, Mylar, .0039 MF	
C22	3596255	Capacitor, Tant., 3.3 MF, 15V	
C23	3596854	Capacitor, Electrolytic, 100 MF	
C23	3597043	Capacitor, Electrolytic, 100 MF	
C24	3596421	Capacitor, Mylar, .01 MF	
C201	3596821	Capacitor, Disc, .033 MF	
C202	3596821	Capacitor, Disc, .033 MF	
C203	3596819	Capacitor, Disc, .1 MF	
C204	3596819	Capacitor, Disc, .1 MF	
C207	3596351	Capacitor, Elect., 100 MF, 16V	
C207	3597248	Capacitor, Elect., 100 MF, 16V	



- NOTES
1. ALL RESISTORS 1/4 WATT EXCEPT AS NOTED.
 2. CAPACITANCE IN MICROFARADS EXCEPT AS NOTED.
 3. R INDICATES PARTS IN RF MODULE 3596853
 4. R INDICATES PARTS IN IF MODULE 3596851
 5. (C) NUMBERS IN CIRCLE ARE MODULE PIN NUMBERS
- C11 - 390PF W/GI TUNER
 130PF W/TRW TUNER
 C12 - OPEN W/GI TUNER
 220PF W/TRW TUNER

W208 & W209 MAY BE RESISTORS IN PRODUCTION.

ELECTRICAL SCHEMATIC, AM/FM MULTIPLEX RADIO



FM PRINTED CIRCUIT BOARD, PARTS LOCATIONS

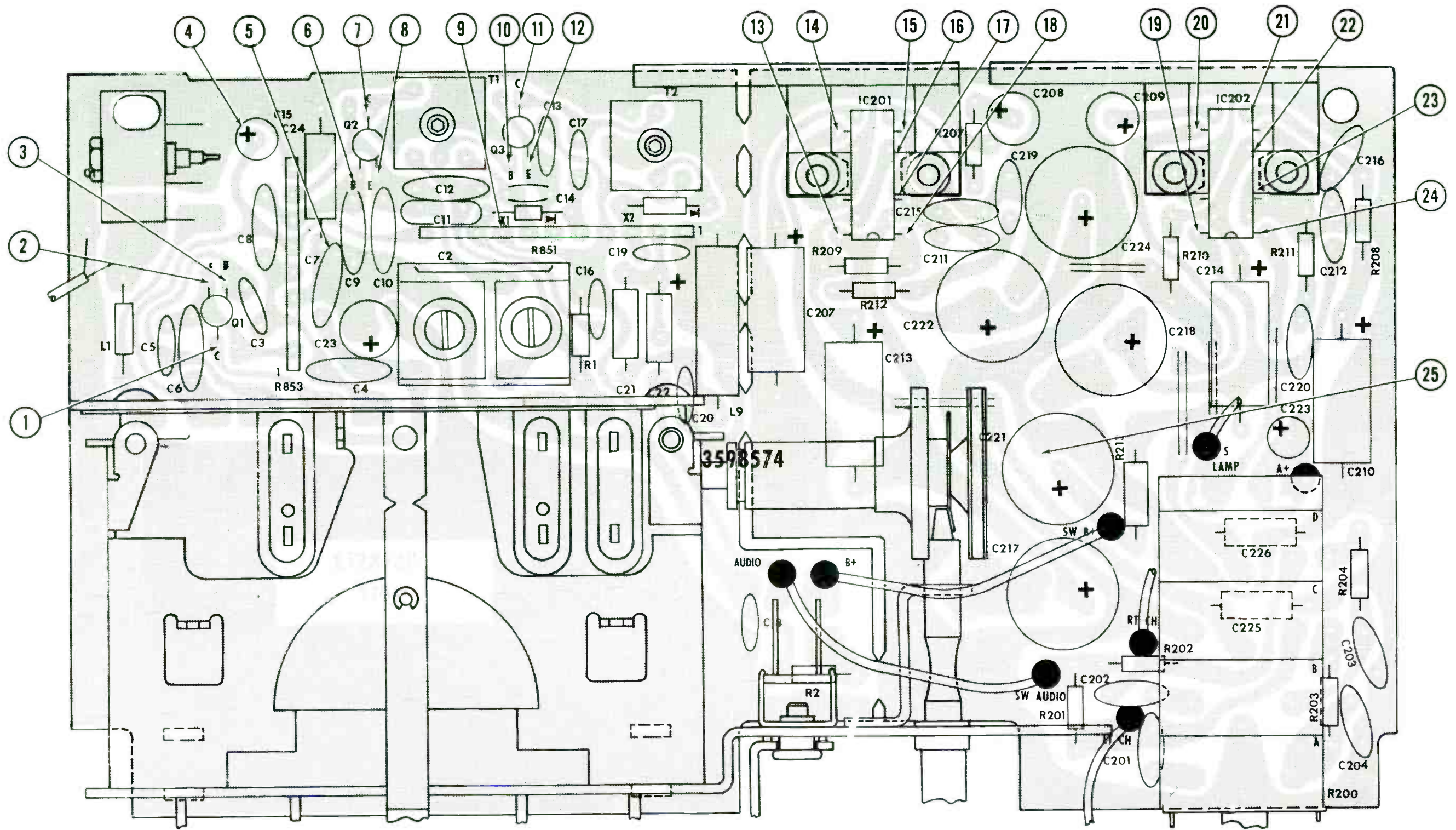
Chrysler 4048142,4048370

REPLACEMENT PARTS LIST AM/FM MULTIPLEX RADIO (P/N 4048370/4048142)

Ref. No.	Part Number	Description	Suggested Price
		CAPACITORS <u>(AM AUDIO BOARD ASSEMBLY P/N 3598574)</u>	
C208	3596855	Capacitor, Elect., 150 MF, 10V	
C209	3596854	Capacitor, Elect., 100 MF, 16V	
C209	3597043	Capacitor, Elect., 100 MF, 16V	
C210	3596098	Capacitor, Elect., 150 MF, 10V	
C211	3596822	Capacitor, Disc, 500 PF	
C212	3596822	Capacitor, Disc, 500 PF	
C213	3596351	Capacitor, Elect., 100 MF, 16V	
C213	3597248	Capacitor, Elect., 100 MF, 16V	
C214	3597043	Capacitor, Elect., 100 MF, 16V	
C215	3596088	Capacitor, Disc, 2700 PF	
C216	3596088	Capacitor, Disc, 2700 PF	
C217	3598544	Capacitor, Elect., 1500 MF, 16V	
C218	3598544	Capacitor, Elect., 1500 MF, 16V	
C219	3597380	Capacitor, Disc, .1 MF	
C220	3597380	Capacitor, Disc, .1 MF	
C221	3598544	Capacitor, Elect., 1500 MF, 16V	
C222	3598544	Capacitor, Elect., 1500 MF, 16V	
C223	3598593	Capacitor, Mylar, .15 MF, 100V	
C224	3598544	Capacitor, Elect., 1500 MF, 16V	
C225	3596883	Capacitor, Mylar, .0047 MF	
C226	3596883	Capacitor, Mylar, .0047 MF	
		CAPACITORS <u>(FM BOARD ASSEMBLY P/N 3598329)</u>	
C101	3596840	Capacitor, F. Comp. 1.8 PF	
C102	3596112	Capacitor, Disc, .0047 MF	
C103	3596138	Capacitor, Disc, .001 MF	
C104	3596089	Capacitor, Disc, .047 MF	
C105	3596112	Capacitor, Disc, .0047 MF	
C106	3596843	Capacitor, F. Comp. .8.2 PF	
C107	3596843	Capacitor, F. Comp. 8.2 PF	
C108	3596841	Capacitor, Disc, F. Comp. 2.7 PF	
C109	3596089	Capacitor, Disc, .047 MF	
C110	3596112	Capacitor, Disc, .0047 MF	
C111	3596112	Capacitor, Disc, .0047 MF	
C112	3596089	Capacitor, Disc, .047 MF	
C113	3596404	Capacitor, Disc, 4.7 PF, N750	
C114	3596408	Capacitor, Disc, 25 PF	
C115	3598002	Capacitor, Disc, 2.7 PF, N330	
C116	3597380	Capacitor, Disc, 4.3 PF	
C117	3596089	Capacitor, Disc, .047 MF	
C118	3596089	Capacitor, Disc, .047 MF	
C119	3596089	Capacitor, Disc, .047 MF	
C120	3596089	Capacitor, Disc, .047 MF	
C121	3596089	Capacitor, Disc, .047 MF	
C122	3596089	Capacitor, Disc, .047 MF	
C123	3598343	Capacitor, Tant., .68 MF	
C124	3596824	Capacitor, Electrolytic, 1.0 MF, 15V	

REPLACEMENT PARTS LIST AM/FM MULTIPLEX RADIO (P/N 4048370/4048142)

Ref. No.	Part Number	Description	Suggested Price
CAPACITORS (FM BOARD ASSEMBLY P/N 3598329)			
C126	3596539	Capacitor, Trimmer, Antenna, 6/25 PF	
C126	3599057	Capacitor, Trimmer, Antenna, 6/25 PF	
C126	3599058	Capacitor, Trimmer, Antenna, 6/25 PF	
C127	3596539	Capacitor, Trimmer, RF, 6/25 PF	
C127	3599057	Capacitor, Trimmer, RF, 6/25 PF	
C127	3599058	Capacitor, Trimmer, RF, 6/25 PF	
C128	3597108	Capacitor, Trimmer, OSC, 3/15 PF	
C128	3599059	Capacitor, Trimmer, OSC, 3/15 PF	
C128	3599060	Capacitor, Trimmer, OSC, 3/15 PF	
C129	3596256	Capacitor, Tant., 1.0 MF	
C130	3597231	Capacitor, Tant., 3.3 MF	
C131	3596827	Capacitor, Polystyrene 3900 PF	
C132	3596421	Capacitor, Mylar, .01 MF	
C133	3596421	Capacitor, Mylar, .01 MF	
C134	3597101	Capacitor, Disc, 100 PF	
C135	3598343	Capacitor, Tant., .68 MF, 15V	
C136	3598343	Capacitor, Tant., .68 MF, 15V	
C137	3596089	Capacitor, Disc, .047 MF	
C138	3596883	Capacitor, Mylar .0047 MF	
C139	3596883	Capacitor, Mylar, .0047 MF	
C140	3596125	Capacitor, Disc, Ceramic, 150 PF	
C141	3596112	Capacitor, Disc, .0047 MF	
RESISTORS (AM AUDIO BOARD ASSEMBLY P/N 3598574)			
R1	3597092-432	Resistor, ½ Watt, 4.3K Ohms, +10%	
R2	3597092-271	Resistor, ½ Watt, 270 Ohms, +10%	
R200	3598602	Control, Volume/Switch/Tone	
R200	3597378	Control, Volume/Switch/Tone	
R201	3597092-153	Resistor, ½ Watt, 15K Ohms, +10%	
R202	3597092-153	Resistor, ½ Watt, 15K Ohms, +10%	
R203	3597092-332	Resistor, ½ Watt, 3.3K Ohms, +10%	
R204	3597092-332	Resistor, ½ Watt, 3.3K Ohms, +10%	
R207	3597091-180	Resistor, ½ Watt, 18 Ohms, +10%	
R208	3597091-180	Resistor, ½ Watt, 18 Ohms, +10%	
R209	3597092-101	Resistor, ½ Watt, 100 Ohms, +10%	
R210	3597092-101	Resistor, ½ Watt, 100 Ohms, +10%	
R211	3597092-2R2	Resistor, ½ Watt, 2.2 Ohms, +10%	
R212	3597092-2R2	Resistor, ½ Watt, 2.2 Ohms, +10%	
R213	3597559-270	Resistor, ½ Watt, 27 Ohms, +10%	
R851	3596851	I.F. Module	
R853	3596853	R.F. Module	



AM/AUDIO PRINTED CIRCUIT BOARD, PARTS LOCATIONS

Chrysler 4048142,4048370

REPLACEMENT PARTS LIST AM/FM MULTIPLEX RADIO (P/N 4048370/4048142)

REPLACEMENT PARTS LIST AM/FM MULTIPLEX RADIO (P/N 4048370/4048142)

Ref. No.	Part Number	Description	Suggested Price
		RESISTORS (FM BOARD ASSEMBLY P/N 3598329)	
R101	3597092-473	Resistor, 1/2 Watt, 47K Ohms, +10%	
R102	3597092-823	Resistor, 1/2 Watt, 82K Ohms, +10%	
R103	3597092-333	Resistor, 1/2 Watt, 33K Ohms, +10%	
R104	3597092-470	Resistor, 1/2 Watt, 47 Ohms, +10%	
R105	3597092-271	Resistor, 1/2 Watt, 270 Ohms, +10%	
R106	3597092-274	Resistor, 1/2 Watt, 270K Ohms, +10%	
R107	3597092-333	Resistor, 1/2 Watt, 33K Ohms, +10%	
R108	3597092-182	Resistor, 1/2 Watt, 1.8K Ohms, +10%	
R109	3597092-680	Resistor, 1/2 Watt, 68 Ohms, +10%	
R110	3597092-271	Resistor, 1/2 Watt, 270 Ohms, +10%	
R111	3597092-101	Resistor, 1/2 Watt, 100 Ohms, +10%	
R112	3597092-391	Resistor, 1/2 Watt, 390 Ohms, +10%	
R113	3597092-103	Resistor, 1/2 Watt, 10K Ohms, +10%	
R114	3597092-332	Resistor, 1/2 Watt, 3.3K Ohms, +10%	
R115	3597092-102	Resistor, 1/2 Watt, 1K Ohm, +10%	
R116	3597092-473	Resistor, 1/2 Watt, 47K Ohms, +10%	
R117	3597092-274	Resistor, 1/2 Watt, 270K Ohms, +10%	
R118	3597092-471	Resistor, 1/2 Watt, 470 Ohms, +10%	
R119	3597092-471	Resistor, 1/2 Watt, 470 Ohms, +10%	
R120	3597092-471	Resistor, 1/2 Watt, 470 Ohms, +10%	
R121	3597092-271	Resistor, 1/2 Watt, 270 Ohms, +10%	
R122	3597092-682	Resistor, 1/2 Watt, 6.8K Ohms, +10%	
R123	3597092-392	Resistor, 1/2 Watt, 3.9K Ohms, +10%	
R124	3597092-103	Resistor, 1/2 Watt, 10K Ohms, +10%	
R125	3597092-473	Resistor, 1/2 Watt, 47K Ohms, +10%	
R127	3597092-474	Resistor, 1/2 Watt, 470K Ohms, +10%	
R128	3597092-331	Resistor, 1/2 Watt, 330 Ohms, +10%	
R129	3597092-123	Resistor, 1/2 Watt, 12K Ohms, +10%	
R130	3597092-123	Resistor, 1/2 Watt, 12K Ohms, +10%	
R131	3597092-123	Resistor, 1/2 Watt, 12K Ohms, +10%	
R132	3597092-123	Resistor, 1/2 Watt, 12K Ohms, +10%	
R133	3597559-100	Resistor, 1/2 Watt, 10 Ohms, +10%	
R134	3596796	Control, Balance	
R134	3597377	Control, Balance	
		RESISTORS (SUB ESCUTCHEON ASSEMBLY P/N 3596811/3598482)	
R301	3596795	Control, Dual Fader	
R301	3596258	Control, Dual Fader	
		TUNERS/TUNER PARTS	
100	3599066	Tuner Assy, TRW (Incl. Pushbuttons)	
101	3599065	Tuner Assy, G.I. (Incl. Pushbuttons)	
102	3596504	Switch, FM/AM	
103	3596516	Actuator Arm (TRW Tuner)	
104	3596525	Actuator, Arm (G.I. Tuner)	

Ref. No.	Part Number	Description	Suggested Price
		TUNERS/TUNER PARTS	
105	359677*	Backdial	
106	3596765*	Lens Assy (TRW Tuner)	
107	3596766*	Lens Assy (G.I. Tuner)	
108	3597514	Gear and Clutch Assy (TRW Tuner)	
109	3597515	Gear and Clutch Assy (G.I. Tuner)	
110	3597516	Pointer Assy (TRW Tuner)	
111	3597517	Pointer Assy (G.I. Tuner)	
112	3596860	Pushbutton	
113	3597285	Shaft (TRW Tuner w/Fader)	
114	3596510	Shaft (G.I. Tuner w/Fader)	
115	3597054	Tuner Coil Deck (G.I. Tuner)	
116	3597055	Tuner Coil Deck (TRW Tuner)	
117	3596752	Declutch Plate Spring (G.I. Tuner)	
118	3596753	Declutch Plate Spring (TRW Tuner)	
119	3596240	Retainer, Shaft	
120	3596295	Button Switch Actuator	
121	3596527	Actuator Spring (G.I.)	
122	3596518	Actuator Spring (TRW)	
		MISCELLANEOUS PARTS	
200	3596773	Cover, Top	
201	3597272	Cover, Bottom	
202	3597184	Clip, Cable	
203	3596294	Clip, Lens	
204	3596772	Shroud, Lamp	
205	3596793	Bezel, Balance Control	
206	3596778	Knob, Balance Control	
207	3596517	AM/FM Switch, Screw (TRW)	
208	3598574	AM & Audio P.C. Board Assy (less Tuner)	
209	3598329	FM P.C. Board Assy (less Tuner)	
210	3596792*	Lamp, Stereo	
211	3597255	Cable Assy, Speaker	
212	3596802	Heatsink	
213	3596526	AM/FM Switch, Screw (G.I.)	
214	3597116	Holder, Stereo Lamp	
215	3597288*	Sub-Escutcheon	
216	3598907	Lamp Holder Assy	
217	3596783*	Lamp, Radio	
218	3597390*	Diffuser, Lamp	
219	3596031	Antenna Connector	
220	3596811	Sub-Escutcheon Assembly	
221	3597295	Light Shield, Foam	
222	3596847	Cable Shielded	
223	3596780	Chassis, Side Back Assembly	
224	3596852	Chassis, Side Assembly	
225	3598486**	Backdial	

* Used in 4048370 Radio.

** Used in 4048142 Radio.

COBRA 98GTL/COBRA 99GTL

ALIGNMENT PROCEDURES

1. Apply specified source voltage, DC 14 Volts.
2. Connect an AC voltmeter (VTVM) across speaker of dummy load either front or rear only. 4 ohms, 10W, non-inductive resistor.
3. Signal input must be kept as low as possible to avoid overload and clipping (use highest possible sensitivity of output indicator).
4. Repeat adjustment to insure good results.
5. Non-metallic alignment tools must be used (especially at FM alignment).

I. AM IF & RF ALIGNMENT USING AM SIGNAL GENERATOR

Set the radio for AM reception. AM signal generator should be coupled with antenna receptacle through AM dummy antenna. Set volume control to maximum and tone to treble. Adjust signal generator output to maintain 1 watt (2.0 volts across 4 ohm load) on AC volt meter.

STEP	GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT INDICATOR	ADJUST	REMARKS
1	455 KHz 400Hz, 30% mod.	Around 1000KHz of non-interference.	AC VTVM across voice coil (L or R) or 4 ohm load.	L158 FL151	Adjust for maximum
2	520 KHz	Low frequency end stop.	AC VTVM across voice coil (L or R) or 4 ohm load.	L157	Adjust for maximum
3	1650 KHz	High frequency end stop.	AC VTVM across voice coil (L or R) or 4 ohm load.	VC152	Adjust for maximum
4	1400 KHz	Tune to Signal	AC VTVM across voice coil (L or R) or 4 ohm load.	VC151 VC701	Adjust for maximum output.
5	Repeat Steps 2,3 and 4 until no further increase. Step 4 should be last step.				

With radio installed in car and antenna extended to desired height, tune in a weak station around 1400 KHz and adjust antenna trimmer VC701 for maximum output.

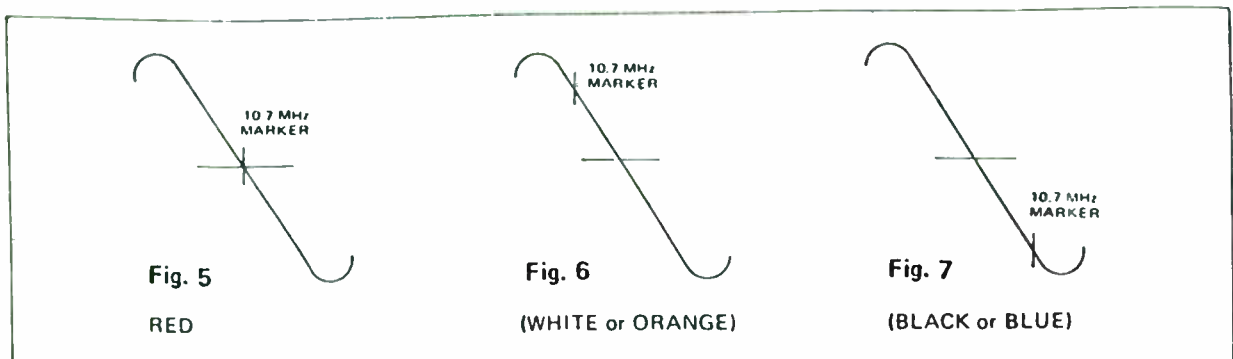
II. FM IF ALIGNMENT USING FM SWEEP GENERATOR

Set the radio for FM reception. Connect sweep generator output to the test point of FM front-end. Use only enough marker signal for indication. Set volume control to maximum 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 TP103 Cold end to ground.	L102	Adjust L102 to obtain symmetry of response similar to Fig.5 or 6 or 7 according to the color of Ceramic filter used.
2	10.7MHz (sweep)	Point of non-interference.	Vert. amp of scope to point TP103 Cold end to ground.	L6 L101	Adjust L6 and L101 for maximum amplitude and straightness of line.
3	Repeat above steps 1 and 2 twice 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: 10.7 MHz, BLUE: 10.67 MHz, 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. 6 or 7). In these cases, disregard 10.7MHz marker.
3. The color of ceramic filters used is different according to the production lots, but, the same color-dotted ceramic filters should be replaced as one pair on the individual units.
4. Be careful 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.



III. FM RF ALIGNMENT USING FM SIGNAL GENERATOR

Set the radio for FM reception. Connect FM signal generator with antenna receptacle through FM dummy antenna. FM S.G. output level; 5-10 microvolts. Set volume control to 1 watt output (2.0 volts at 4 ohm load) and tone to treble.

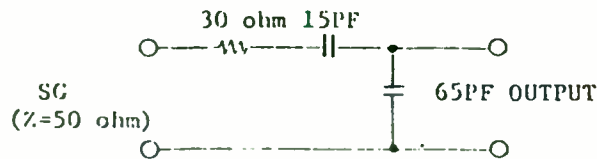
STEP	GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT INDICATOR	ADJUST	REMARKS
1	87MHz (400Hz, 22.5KHz dev)	Low frequency end stop	Output meter across 4 ohm load.	C-22 (OSC)	Adjust for maximum

IV. MULTIPLEX ADJUSTMENT USING FREQUENCY COUNTER

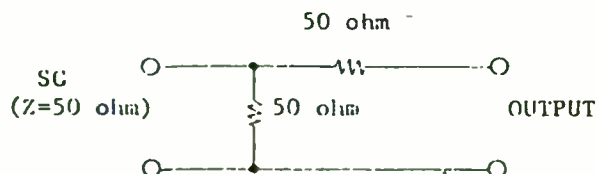
Set the radio for FM reception. Connect frequency counter to TP101. Connect FM signal generator with antenna receptacle through FM dummy antenna. Apply 98MHz signal modulated by composite stereo signal from Stereo Signal Generator. Tune the radio in the signal. Set volume control to 1 watt output. Then cut the pilot signal of 19KHz off. Adjust VR101 for 19.00KHz indication on the frequency counter.

Dummy Antenna

a. AM



b. FM.



V TAPE DECK ALIGNMENT

Cobra 98GTL 8-Track Player Alignment

Head Height & Head Azimuth Adjustment

Play the test tape VICTOR VTT-801 or equivalent

Select Program No.2

Adjust the Head Height Adjustment Screw to obtain the minimum output of 1000 Hz on left Channel.

Adjust the Head Azimuth Screw to obtain the maximum output of 8000 Hz on right channel.

Cobra 99GTL Cassette Tape Player Alignment

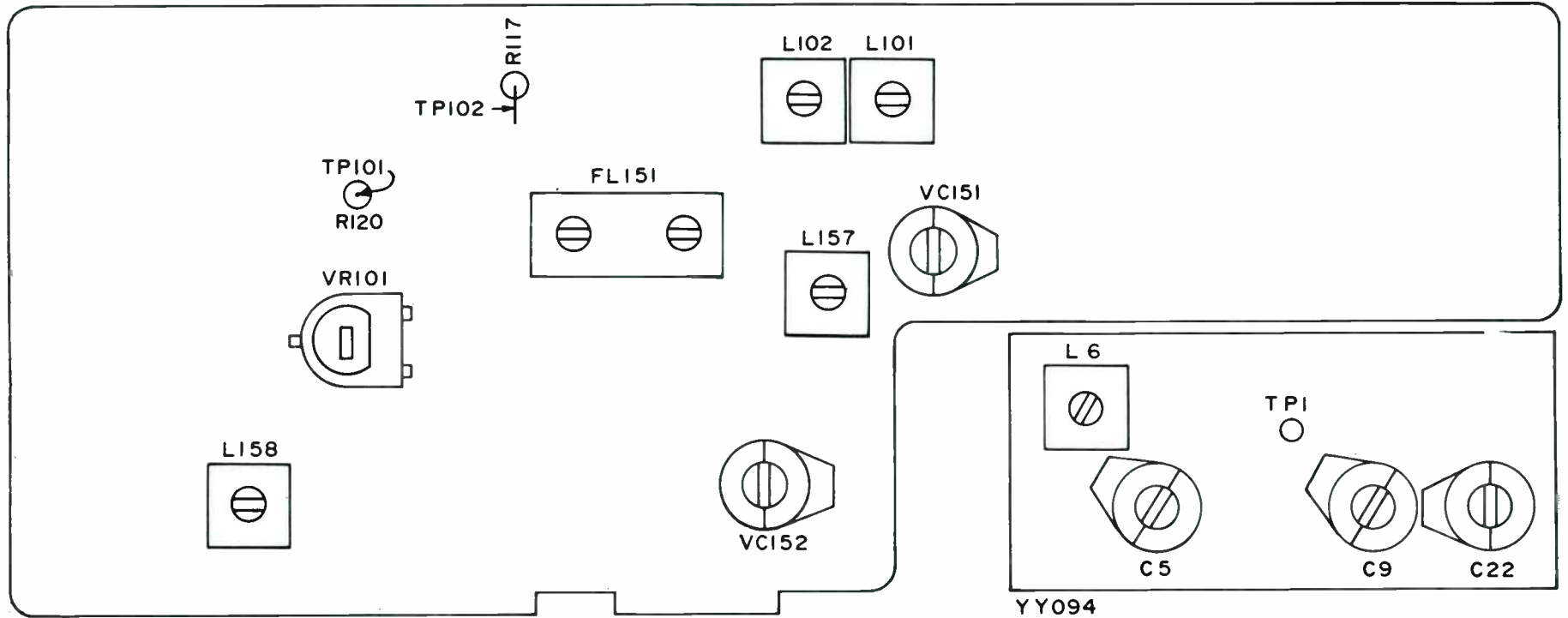
Head Azimuth Adjustment

Play the test tape TEAC MTT-113

Adjust Head Azimuth Adjustment Screw to obtain the maximum output.

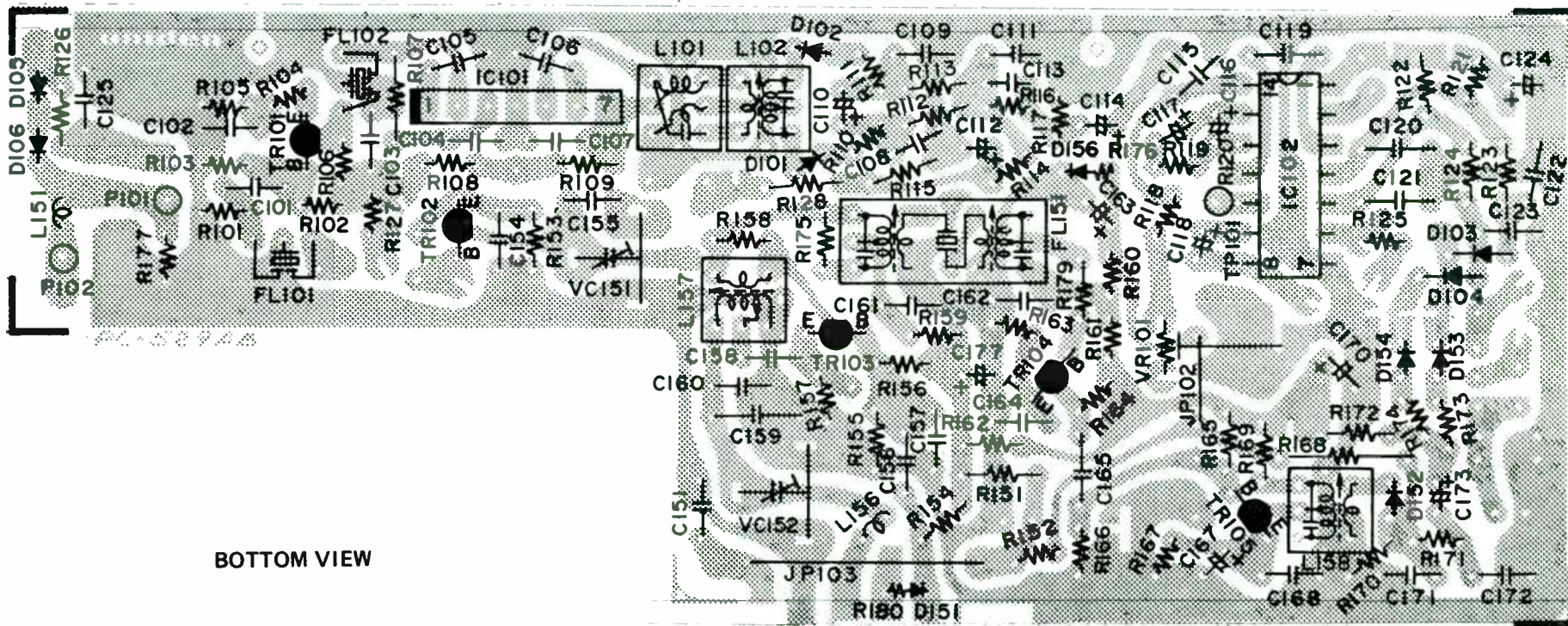
FM FRONT END ALIGNMENT LAYOUT

PC-529AB

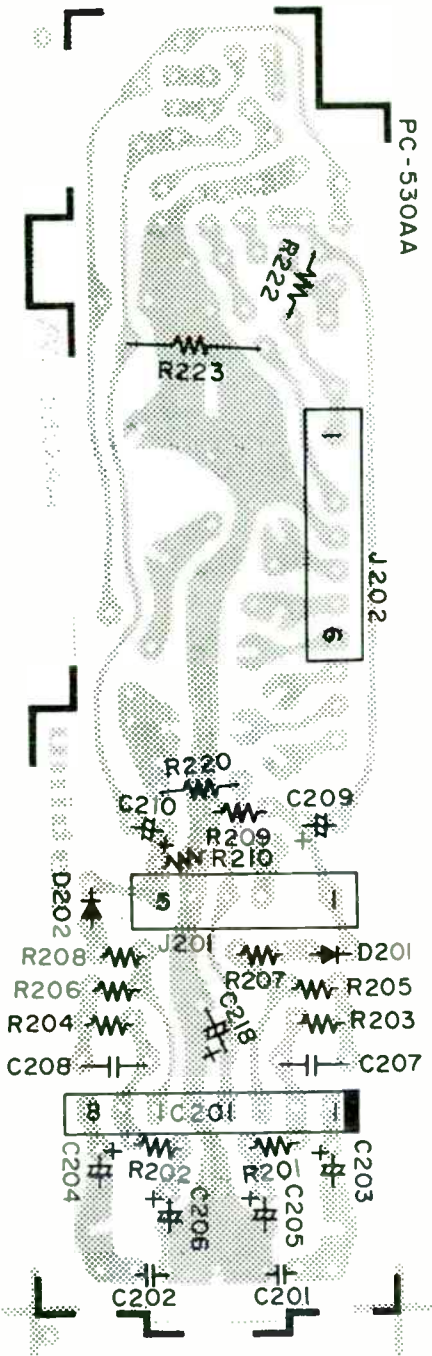
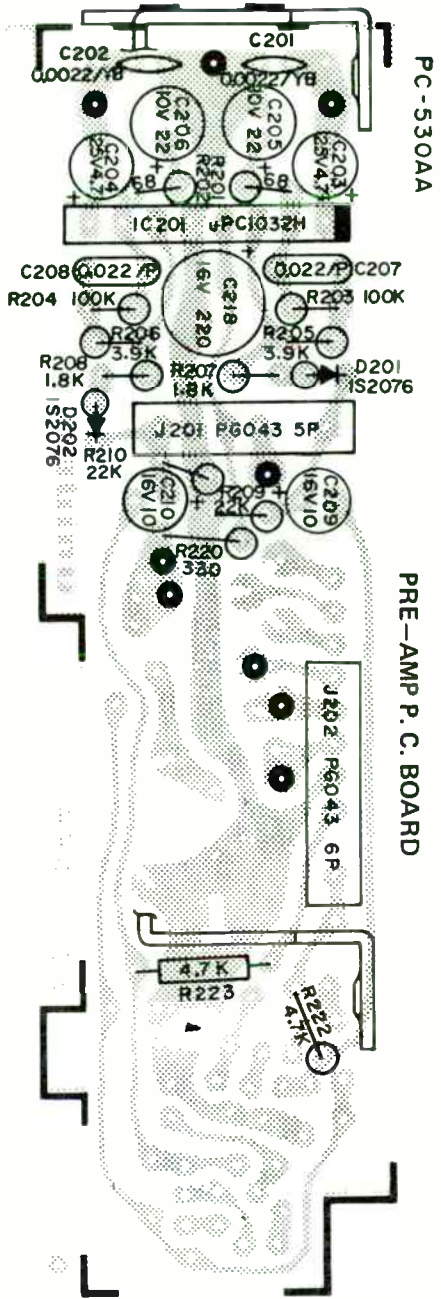


MAIN P. C. BOARD

PC-529AB

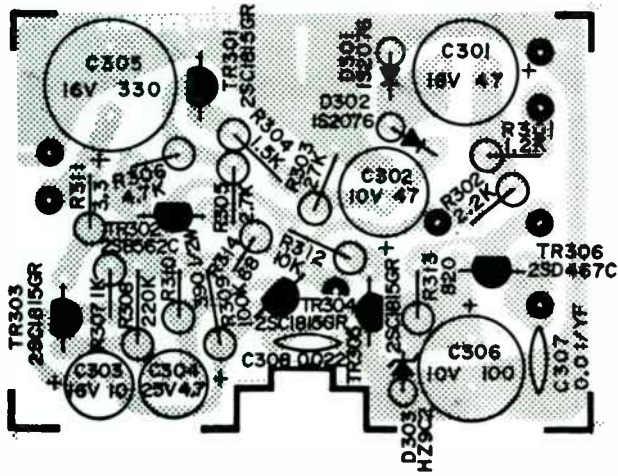


BOTTOM VIEW



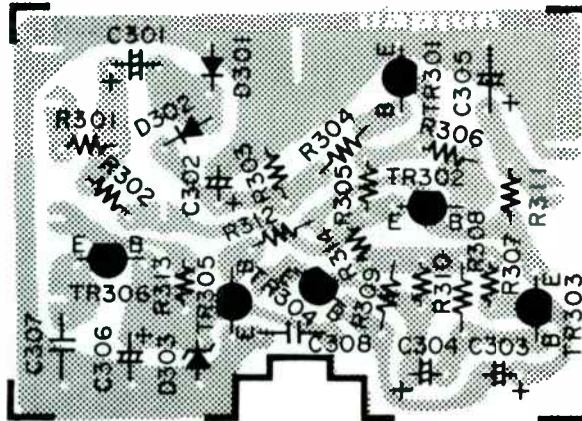
MOTOR CONTROL P. C. BOARD
(99 G. T. L. ONLY)

PC-535AA



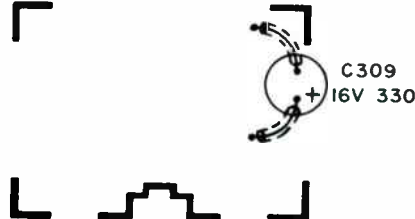
TOP VIEW

PC-535AA



BOTTOM VIEW

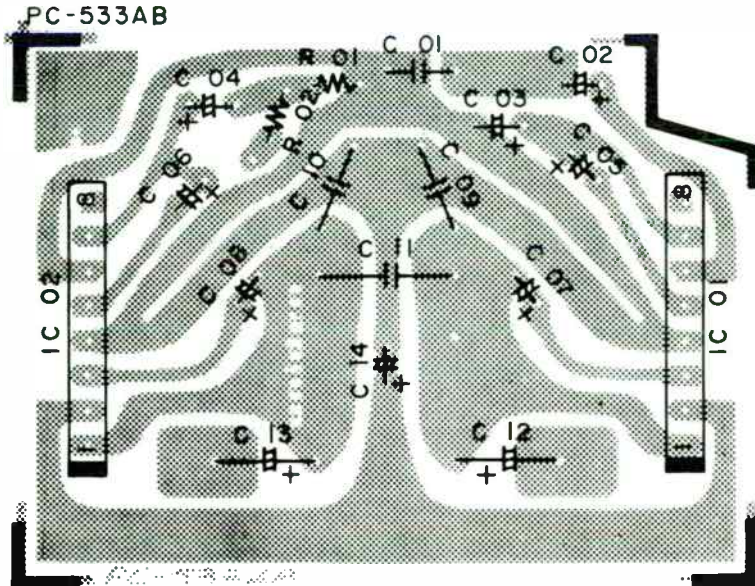
PC-535AA



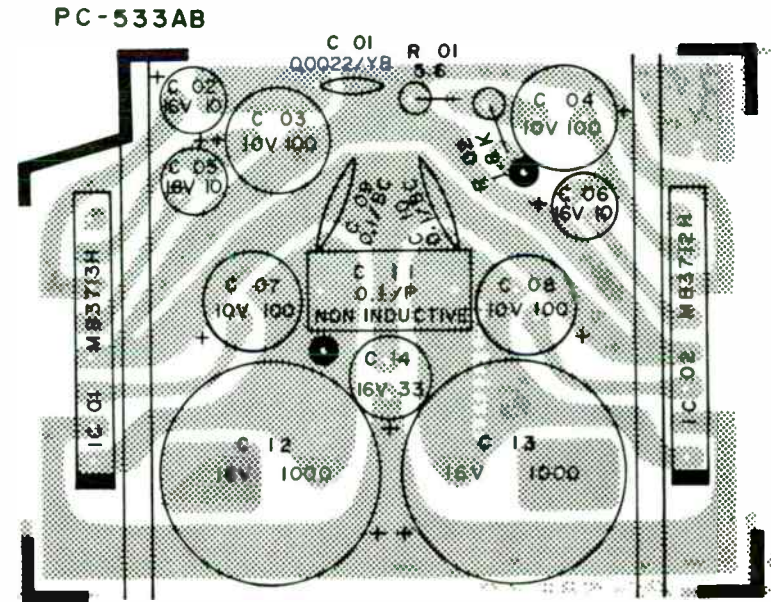
ADDITIONAL PARTS
BOTTOM VIEW

POWER AMP. P. C. BOARD

BOTTOM VIEW



TOP VIEW



* REFERENCE NUMBERS SHOULD BE READ ADDING 500 FOR LEFT CHANNEL AMPLIFIER AND ADDING 600 FOR RIGHT CHANNEL AMPLIFIER.

* REFERENCE NUMBERS SHOULD BE READ ADDING 500 FOR LEFT CHANNEL AMPLIFIER AND ADDING 600 FOR RIGHT CHANNEL AMPLIFIER.

Cobra 98GTL, 99GTL

**CIRCUIT
SYMBOL**

DESCRIPTION

**DYNASCAN
PART NO.**

SEMICONDUCTORS

IC-101	Integrated Circuit, uPC577H	307-112-9-007
IC-102	Integrated Circuit, HA12003	307-155-9-001
IC201	Integrated Circuit, uPC1032H	307-131-9-004
IC-502,602	Integrated Circuit, MB3712HM	307-155-9-002
IC-501,601	Integrated Circuit, MB3713HM	307-155-9-003
TR-101, 103, 104, 105	Transistor, 2SC1815-0	176-085-9-002
TR301, 303, 304, 305	Transistor, 1SC1815-GR	176-095-9-001
TR-302	Transistor, 2SB562-C	172-051-9-001
TR-306, 106*	Transistor, 2SD467-C	172-050-9-001
TR-102	Transistor, 2SC941TM-0	176-089-9-004
D101, 102, 152	Diode, 1N60P	150-006-9-001
D-103, 104, 301, 302, 302, 151, 153, 154, 201, 202	Diode, 1S1076	151-067-9-001
D-303, 155*	Diode, Zener, HZ9C-2	152-095-9-001
D-701	Diode, LED, LN211RP	158-027-9-001
D-702, 401*, 402* 403*, 404*	Diode, LED, LN311GP	158-027-9-002
D-105, 106	Diode, 1S2473K	151-069-9-001

INDUCTORS

L-151, 156	Inductor, Molded, LZ-002 4.7uH	041-093-9-004
L-101	Coil, LB-100	046-029-9-001
L-102	Coil, LB-085	046-019-9-002
L-157	Coil, LB-098	046-021-9-003
L-158	Coil, LB-077	046-029-9-002
CH-701	Coil AF Choke, TF-136	042-029-9-001

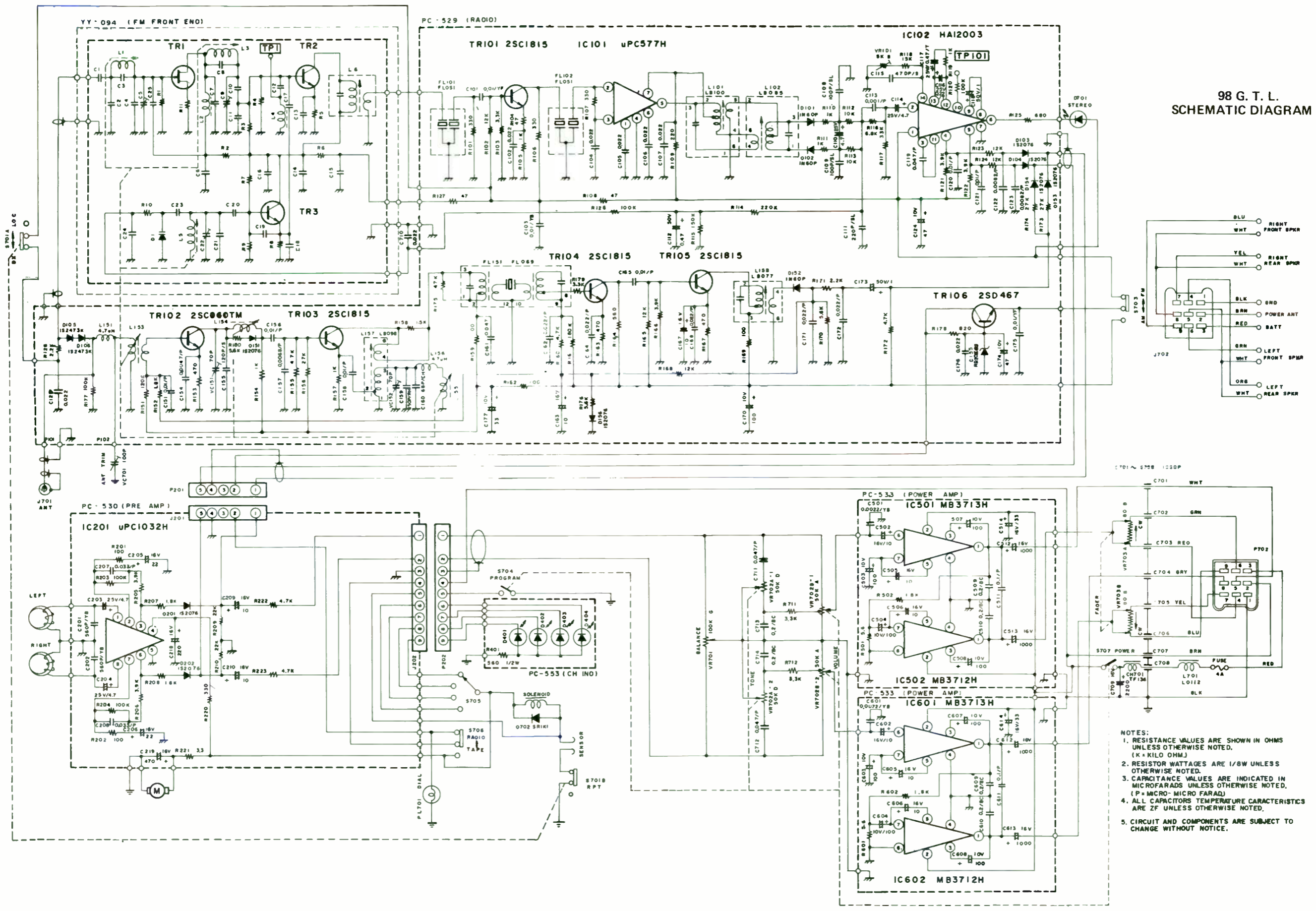
SEMI FIXED & VARIABLE RESISTORS

VR-101	Resistor, Semi-fixed, RV-189, 5K ohm B	008-316-9-004
VR-702, S707, 704*	Resistor, Variable, RV-382	008-359-9-001
VR-701	Res., Variable, RV-385	008-359-9-002
VR-701 *	Res., Variable RV-396	008-358-9-002
VR-703	Res., Variable, RV-384	008-358-9-003

FIXED RESISTORS

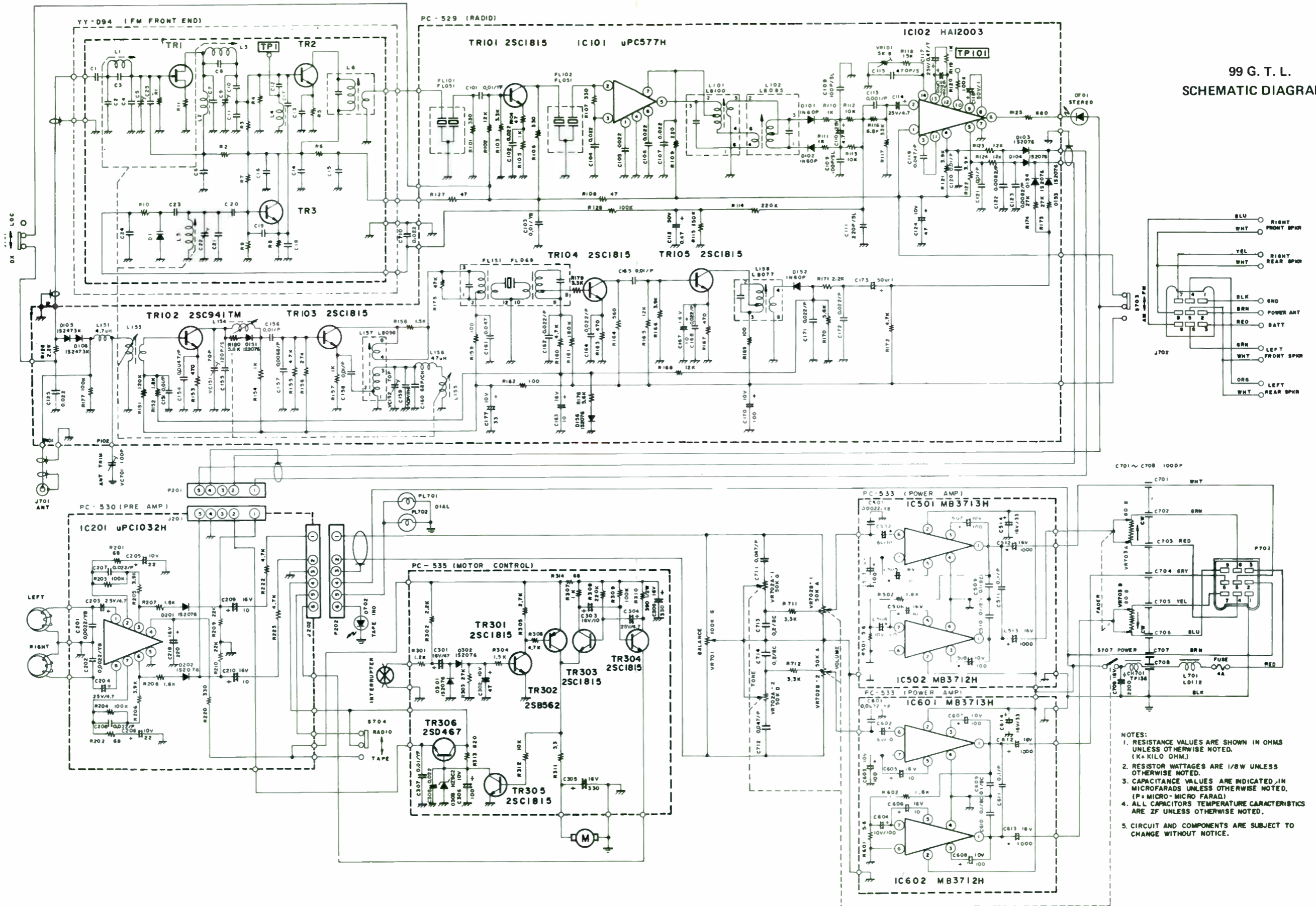
R711, 712	Res., Carb., Axial Lead, 3.3K ohm 1/8W J	002-108-5-332
R222, 223	Res., Carb., Axial Lead, 4.7K ohm 1/8W J	002-108-5-472
R-120	Res., Carb., Axial lead, 100K ohm 1/8W J	002-108-5-104
R-310	Res., Carb., Axial Lead, 390 ohm 1/2W J	002-102-5-391
R-311	Res., Carb., Formed VERT. 3.3K ohm 1/8W J	002-108-5-332
R-221 *	Res., Carb. 3.3HM Y4W	002-108-5-339
R-501, 601	Res., Carb., Formed VERT, 5.6 ohm 1/8W J	002-108-5-569
R-104, 108, 127	Res., Carb., Formed VERT, 47 ohm 1/8W J	002-108-5-470
R-201, 202, 314	Res., Carb., Formed VERT, 68 ohm 1/8W J	002-108-5-680
R-159, 162, 201*, 202*	Res., Carb., Formed VERT, 100 ohm 1/8W J	002-108-5-101
R-109	Res., Carb., Formed VERT, 220 ohm 1/8W J	002-108-5-221
R-101, 153, 106, 107, 163,220	Res., Carb., Formed VERT, 330 ohm 1/8W J	002-108-5-331
R-167	Res., Carb., Formed VERT, 470 ohm 1/8W J	002-108-5-471
R-164, R 401	Res., Carb., Formed VERT, 560 ohm 1/8W J	002-108-5-561
R-125	Res., Carb., Formed VERT, 680 ohm 1/8W J	002-108-5-681
R313, R 178*	Res., Carb., Formed VERT, 820 ohm 1/8W J	002-108-5-821
R-105, 110, 111, 119, 154 157, 171, 307	Res., Carb., Formed VERT, 1K ohm 1/8W J	002-108-5-102
R-301	Res., Carb., Formed VERT, 1.2K ohm 1/8W J	002-108-5-122
R-158, 304	Res., Carb., Formed VERT, 1.5K ohm 1/8W J	002-108-5-152
R-207, 208, 502, 602	Res., Carb., Formed VERT, 1.8K ohm 1/8W J	002-108-5-182
R-126, 152, 166, 302	Res., Carb., Formed VERT, 2.2K ohm 1/8W J	002-108-5-222
R-305	Res., Carb., Formed VERT, 2.7K ohm 1/8W J	002-108-5-272
R-103	Res., Carb., Formed VERT, 3.3K ohm 1/8W J	002-108-5-332
R-121, 122, 205, 206	Res., Carb., Formed VERT, 3.9K ohm 1/8W J	002-108-5-392
R-116, 155,160,306,222	Res., Carb., Formed VERT, 4.7K ohm 1/8W J	002-108-5-472
R-176	Res., Carb., Formed VERT, 8.2K ohm 1/8W J	002-108-5-822
R-112, 113,312,170,172	Res., Carb., Formed VERT, 10K ohm 1/8W J	002-108-5-103
R-102, 123, 124, 165	Res., Carb., Formed VERT, 12K ohm 1/8W J	002-108-5-123
R-118, 168	Res., Carb., Formed VERT, 15K ohm 1/8W J	002-108-5-153
R-117, 209, 210	Res., Carb., Formed VERT, 22K ohm 1/8W J	002-108-5-223
R-156, 173,174,303	Res., Carb., Formed VERT, 27K ohm 1/8W J	002-108-5-273
R-175	Res., Carb., Formed VERT, 47K ohm 1/8W J	002-108-5-473
R-128,177,203,204,309	Res., Carb., Formed VERT, 100K ohm 1/8W J	002-108-5-104
R-151	Res., Carb., Formed VERT, 120K ohm 1/8W J	002-108-5-124
R-115	Res., Carb., Formed VERT, 150K ohm 1/8W J	002-108-5-154
R-161	Res., Carb., Formed VERT, 180K ohm 1/8W J	002-108-5-184
R-308-114	Res., Carb., Formed VERT, 220K ohm 1/8W J	002-108-5-224

98 G. T. L.
SCHEMATIC DIAGRAM

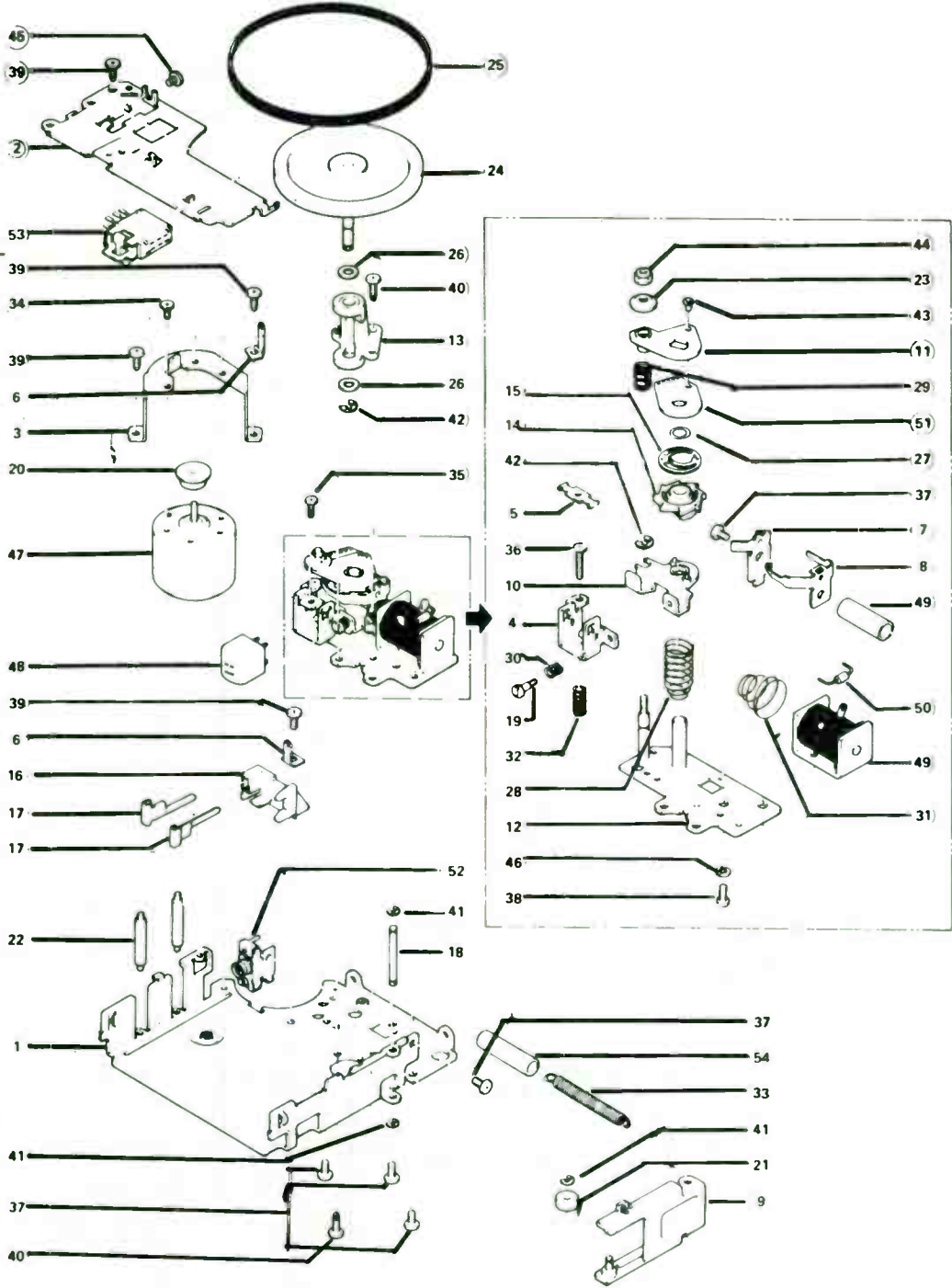


Cobra 98GTL,99GTL

99 G. T. L. SCHEMATIC DIAGRAM

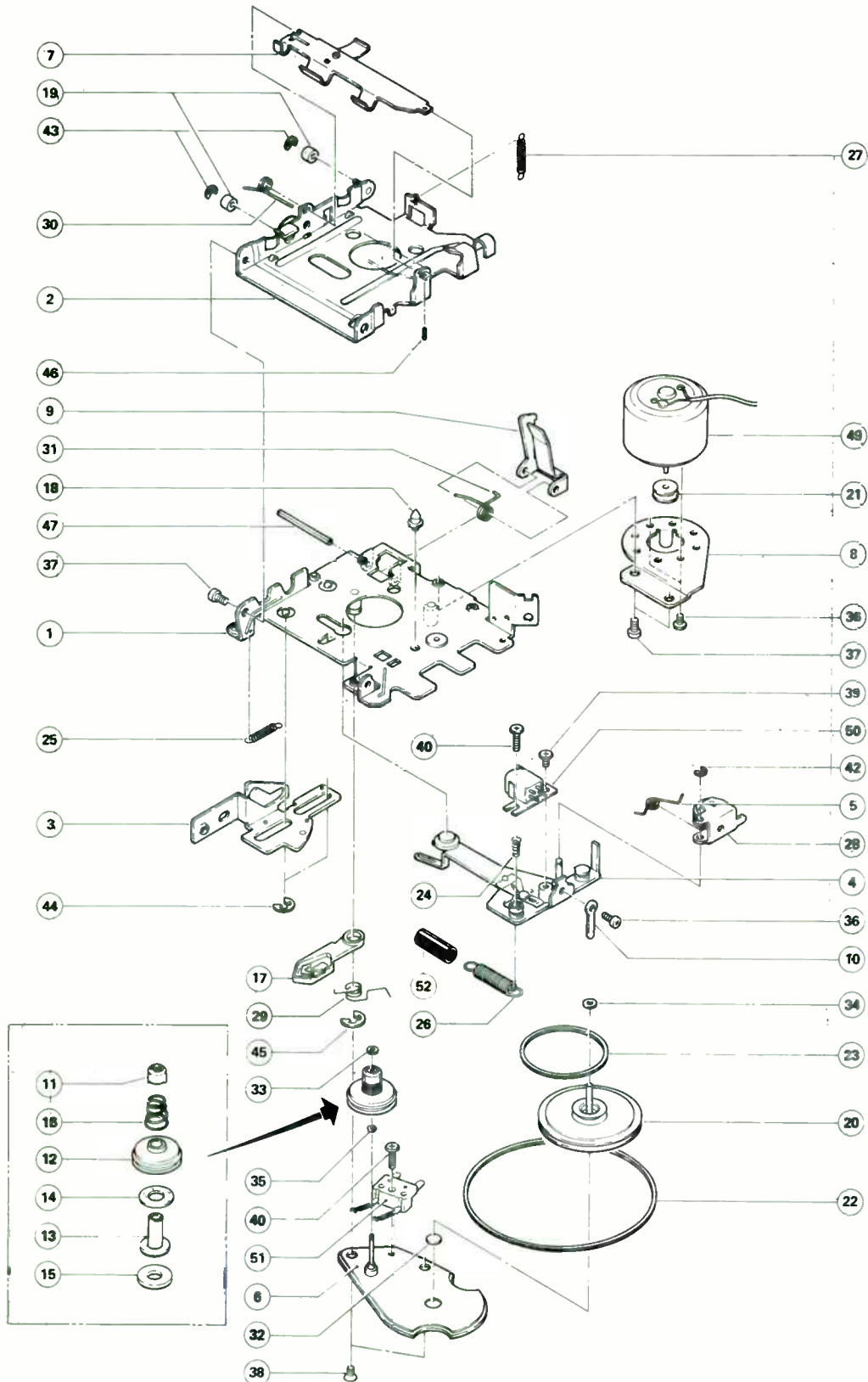


8 TRACK DRIVE ASSEMBLY



REF. NO.	MANUFACTURER PART NO.	Model 98GTL DESCRIPTION	QTY.	DYNASCAN PART NUMBER
1	MDBP206770	Chassis	1	257-115-9-001
2	MDBP406771	Gate Plate	1	261-098-9-001
3	MDBP406772	Motor Holder	1	251-391-9-001
4	MDBP406975	Head Holder	1	251-392-9-001
5	MDBP406976	Head Clamp	1	741-112-9-001
6	MDBP406775	Lug	2	744-029-9-001
7	MDBP406776	Solenoid Guide Plate	1	251-393-9-001
8	MDBP406777	Select Spring	1	767-067-9-001
9	MDBA406778	Pressure Arm Ass'y.	1	523-250-9-001
	MDBP406779	Arm	(1)	763-134-9-001
	MDHP406780	Pressure Roller Shaft	(1)	763-134-9-002
10	MDBA406781	Movable Plate Ass'y.	1	523-251-9-001
	MDBP406782	Movable Plate	(1)	261-099-9-001
	MDHP406783	Metal	(1)	261-100-9-001
	MDHP406784	Cam Follow Pin	(2)	763-134-9-003
11	MDBA406785	Height Plate Ass'y.	1	523-252-9-001
	MDBP406786	Height Plate	(1)	261-101-9-001
	MDHP406787	Metal	(1)	261-102-9-001
12	MDBA406788	Head Chassis Ass'y.	1	523-253-9-001
	MDBP406789	Head Chassis	(1)	257-116-9-001
	MDHP406790	Main Shaft	(1)	763-134-9-004
	MDHP406791	Guide Shaft	(1)	763-134-9-005
13	MDMA406792	Flywheel Metal Ass'y.	1	523-254-9-001
	MDMP306793	Metal Holder	(1)	251-394-9-001
	MDMP406794	Oil Less Metal	(2)	261-103-9-001
14	MDMP406796	Cam	1	763-134-9-006
15	MDBP406797	Indicator Contact	1	763-134-9-007
16	MDMP306799	Tape Guide	1	261-104-9-001
17	MDBP406800	Sensing Plate	2	261-105-9-001
18	MDHP406801	Arm Shaft	1	763-134-9-008
19	MDHP406802	Stud Screw	1	634-120-9-001
20	MDHP406803	Motor Pulley	1	743-009-9-001
21	MDMP406804	Pressure Roller	1	763-134-9-009
22	MDMP406805	Roller	2	763-134-9-010
23	MDHP406815	Nut Collar	1	763-134-9-011
24	MDMA406978	Flywheel Ass'y.	1	523-255-9-001
	MDHP406979	Shaft	(1)	763-134-9-012
25	MDZP406807	Belt	1	763-134-9-013
26	MDZP406808	Washer	2	724-034-9-001
27	MDZP406816	Washer	1	724-034-9-002
28	MDZP406809	Spring	1	767-067-9-002
29	MDZP406810	Spring	1	767-067-9-003
30	MDZP406811	Spring	1	767-067-9-004
31	MDZP406812	Spring	1	767-067-9-005
32	MDZP406813	Spring	1	767-067-9-006
33	MDZP406814	Spring	1	767-067-9-007
34	MZSN102603	Screw, Pan Hd. M2.6x3	3	634-120-9-002
35	MZSN202606	Screw, Bind Hd. M2.6x6	1	634-120-9-003
36	MZSN202614	Screw, Bind Hd. M2.6x14	1	634-120-9-004
37	MZSN203005	Screw, Bind Hd. M3x5	5	634-120-9-005
38	MZSN113505	Screw, Pan Hd. M3.5x5	2	634-120-9-006
39	MZSN333006	Taptite Screw, Pan Hd. M3x6	4	710-048-9-001
40	MZSN263008	Tapping Screw, Bind Hd. M3x8	3	710-048-9-002
41	MZSN520020	E-Ring 2.0	3	741-099-9-003
42	MZSN520030	E-Ring 3.0	2	741-112-9-002
43	MZTT252030	Eyelet 2x3	1	735-013-9-001
44	MZTT230030	Nylon Nut M3	1	653-054-9-001
45	MZSN202605	Screw, Bind Hd. M2.6x5	1	634-120-9-007
46	MZSN510035	Spring Washer 3.5	2	731-057-9-001
47	ZYYY103001	DC Motor YY-103	1	461-001-9-001
48	ZYYY093001	Magnetic Head YY-093	1	523-256-9-001
49	ZYYY100001	Solenoid Coil Ass'y. YY-100	1	523-257-9-001
50	DDAY103001	Diode S-5277B	1	151-076-9-001
51	PPCY432011	Indicator PC Board	1	302-405-9-001
52	CCVY039001	Ant. Trimmer CV-309 100pF	1	028-056-9-001
53	SWWY173001	Slide Switch SW-173	1	084-074-9-001
54		Vinyl Sleeve	1	386-056-9-001

CASSETTE DRIVE ASSEMBLY



REF. NO.	MANUFACTURER PART NO.	Model 99GTL DESCRIPTION	QTY.	DYNASCAN PART NUMBER
1	MDBA306320	Chassis Ass'y.	1	523-259-9-001
	MDBP206321	Chassis	(1)	257-117-9-001
	MDHP406322	Flywheel	(1)	763-135-9-001
	MDHP406323	Reel Holder Stud A	(1)	759-090-9-001
	MDHP406324	Reel Holder Stud B	(1)	759-090-9-002
2	MDHP406325	Eject Lever Shaft	(2)	763-135-9-002
	MDBA406326	Sub Chassis Ass'y.	1	523-260-9-001
	MDBP206327	Sub Chassis	(1)	258-045-9-001
	MDBP406328	Cassette Spring	(1)	767-068-9-001
3	MDHP406329	Roller Shaft	(2)	763-135-9-003
	MDBA406330	Eject Lever Ass'y.	1	523-261-9-001
	MDBP306331	Eject Lever	(1)	261-106-9-001
4	MDHP406332	Eject Lever Pin	(1)	763-135-9-004
	MDBA406333	Head Base Ass'y.	1	523-262-9-001
	MDBP406334	Head Base	(1)	261-107-9-001
	MDBP406335	Head Base Spring	(1)	767-068-9-002
	MDHP406336	Head Stud A	(1)	759-090-9-003
	MDHP406337	Head Stud B	(1)	759-090-9-004
	MDHP406338	Pinch Roller Arm Shaft	(1)	763-135-9-005
	MDHP406339	Head Base Stud	(1)	759-090-9-005
	MDBP406340	Head Base Metal	(1)	251-395-9-001
	MDHP406341	Head Base Pin	(1)	763-135-9-006
	MDZP406342	Washer A 7x4	(1)	724-035-9-001
	MZSS632020	Rivet Flat Hd. 2x2	(1)	733-026-9-001
	5	MDBA406343	Pinch Roller Ass'y.	1
MDBP406344		Pinch Roller Arm	(1)	261-108-9-001
MDZP406345		Pinch Roller	(1)	261-109-9-001
MDHP406346		Pinch Roller Shaft	(1)	763-135-9-007
6	MDBA406347	Reel Holder Ass'y.	1	523-264-9-001
	MDBP406348	Reel Holder	(1)	251-396-9-001
	MDHP406349	Reel Shaft	(1)	763-135-9-008
7	MDBA406350	Cassette Holder Ass'y.	1	523-265-9-001
	MDBP406351	Cassette Holder	(1)	261-110-9-001
	MDBP406352	Cassette Spring A	(1)	767-068-9-003
	MZSS632020	Rivet Flat Hd. 2x2	(1)	733-026-9-001
8	MDBP406384	Motor Holder B	1	251-397-9-001
9	MDBP406355	Eject Arm	1	261-111-9-001
10	MDBP405327	Cord Clamp	1	763-123-9-010
11	MDMP406357	Reel Stopper	1	261-112-9-001
12	MDMP406358	Reel	1	763-135-9-009
13	MDMP406359	Reel Driver	1	763-135-9-010
14	MDZP406360	Felt Washer	1	347-083-9-001
15	PPCY218011	Senser PC Board	1	302-406-9-001
16	MDZP406362	Reel Spring	1	767-068-9-004
17	MDMP306363	FF Lock Cam	1	763-135-9-011
18	MDMP406364	Cassette Guide Boss A	1	261-113-9-001
19	MDHP406366	Roller	2	763-135-9-012
20	MDHP406367	Flywheel	1	763-135-9-013
21	MDMP406382	Motor Pulley	1	743-010-9-001
22	MDZP406385	Belt C	1	743-010-9-002
23	MDZP406369	Belt B	1	743-010-9-003
24	MDZP406370	Spring A	1	767-068-9-005
25	MDZP406371	Spring B	1	767-068-9-006
26	MDZP406372	Spring C	1	767-068-9-007
27	MDZP406373	Spring D	1	767-068-9-008
28	MDZP406374	Spring E	1	767-068-9-009
29	MDZP406375	Spring F	1	767-068-9-010
30	MDZP406376	Spring G	1	767-068-9-011
31	MDZP406377	Spring H	1	767-068-9-012
32	MDZP406353	Spacer	1	759-090-9-006
33	MDZP406378	Washer B 3x1.2	1	724-035-9-002
34	MDZP406379	Washer C 5x2	1	724-035-9-003
35	MDZP406380	Washer D 3x1.5	1	724-035-9-004
36	MZSZ102604	Screw, Pan Hd. M2.6x4	3	634-121-9-001
37	MZSZ103004	Screw, Pan Hd. M3x4	4	634-121-9-002
38	MZSZ132604	Screw, Flat Hd. M2.6x4	2	634-121-9-003
39	MZSZ192004	Screw, Bind Hd. M2x4	1	634-121-9-004
40	MZSZ192008	Screw, Bind Hd. M2x8	2	634-121-9-005
41	N.A.			
42	MZSN520015	E-Ring 1.5	1	741-113-9-001
43	MZSN520020	E-Ring 2	2	741-099-9-003
44	MZSN520030	E-Ring 3	2	741-112-9-002
45	MZSN520040	E-Ring 4	1	741-099-9-004
46	MZSK661204	Spring Pin 1.2x4	1	763-135-9-014
47	MZSK662525	Spring Pin 2.5x25	1	763-135-9-015
48	MZTT150030	Terminal Lug 3.2x8x16	1	345-052-9-001
49	ZYYY095001	Motor YY-095	1	461-002-9-001
50	ZYYY091001	Head YY-091	1	523-266-9-001
51	MDMA406383	Sensing Contact Ass'y.	1	523-267-9-001
52		Vinyl Sleeve	1	386-057-9-001

CIRCUIT SYMBOL	DESCRIPTION	DYNASCAN PART NO.
CAPACITORS		
C-701,702,703,704,705,706,707,708	Capacitor, Feed Thru, CZ-060	033-045-9-001
C-112	Capacitor, Electrolytic, 0.47uF 50V	022-157-9-001
C-118, 173	Cap., Lytic, 1uF 50V	022-157-9-002
C-110,114,203,204,304	Cap., Lytic, 4.7 uF 25V	022-157-9-003
C-167,209,210,303,502,505 506,602,605,606,163	Cap., Lytic, 10uF 16V	022-157-9-004
C-205, 206	Cap., Lytic, 22uF 10V	022-163-9-001
C-177	Cap., Lytic, 33uF 10V	022-158-9-005
C-514, 614	Cap., Lytic, 33uF 16V	022-157-9-006
C-124, 302, 174*	Cap., Lytic, 47uF 10V	022-160-9-002
C-301	Cap., Lytic, 47uF 16V	022-164-9-002
C-170,306,503,504,507,508 603,604,607,608	Cap., Lytic, 100uF, 10V	022-157-9-008
C-218	Cap., Lytic, 100uF, 10V	022-157-9-008
C-219 *	Cap., Lytic, 220uF, 16V	022-187-9-001
C-305	Cap., Lytic 470uV, 16V	022-187-9-002
C-512, 513,612,613	Cap., Lytic 330uF 16V	022-188-9-001
C-709	Cap., Lytic, 1000uF 16V	022-163-9-004
C-116	Cap., Lytic, 2200uF 16V	022-157-9-005
C-117	Cap., Tantalum, 0.22uF 25 V M	027-042-9-001
C-155	Cap., Tantalum, 0.47uF 25V M	027-040-9-002
C-115	Cap., Polystyrene, 120pF 50V J	030-043-9-001
C-113	Cap., Polystyrene, 470pF 50V J	030-042-9-002
C-157	Cap., Mylar, 0.001uF 50V K	025-074-9-003
C-154	Cap., Mylar, 0.0068uF 50V K	025-122-9-003
C-151, 158, 156, 165 120, 121	Cap., Mylar, 0.0047uF 50V K	025-126-9-001
C-122, 123	Cap., Mylar, 0.01uF 50 V K	025-121-9-002
C-162, 164, 168, 171, 172 207, 208	Cap., Mylar, 0.0082uF 50 V K	025-146-9-001
C-119, 711, 712	Cap., Mylar, 0.022uF 50 V K	025-121-9-006
C-511, 611	Cap., Mylar, 0.047uF 50 V K	025-146-9-002
C-108, 109	Cap., Ceramic, 100pF 50 V K SL	020-180-9-016
C-111	Cap., Car., 220pF 50V K SL	020-180-9-019
C-160	Cap., Cer., 68pF 50 V J CH	020-227-9-001
C-159	Cap., Cer., 150pF 50 V J RH	020-227-9-002
C-201, 202 *	Cap., Cer., 560pF 50V	020-190-9-020
C-201, 202, 501, 601	Cap., Cer., 0.0022uF 50V K YB	020-190-9-018
C-101, 307, 175 *	Cap., Cer., 0.01uF 50V Z YF	020-190-9-015
C-102, 107, 104, 105, 106 125, 126, 176	Cap., Cer., 0.022uF 25V Z ZF	020-213-9-004
C-103	Cap., Cer., 0.01uF 50V M YB	020-227-9-003
C-161	Cap., Cer., 0.047uF 25V Z ZF	020-205-9-010
C-713, 714	Cap., Cer., 0.2uF 12V M BC	020-190-9-037
C-509, 510, 609, 610	Cap., Semiconductor, 0.1uF 12V Z BC	020-227-9-004
VC-151, 152	Cap., Trimmer, CV-021 70pF	028-047-9-001
VC-701	Cap., Trimmer, CV-039 100pF	028-056-9-001
MISCELLANEOUS		
FL-101, 102	Filter, Ceramic, FL-051	140-019-9-001
FL-151	Filter, Ceramic, FL-069	140-023-9-001
S-701, 703	Switch, Push, SW-169	088-052-9-001
S-703 *	Slide Switch	084-072-9-001
	Mini-Switch, SW-135	080-011-9-001
	Tuner Ass'y. Pushbutton, YY-094	523-241-9-001
	Tape Deck Ass'y., UM-110A	523-243-9-001
J-201	Plug, PG-043 5P	523-210-9-002
J-202	Plug, PG-043 6P	523-243-9-002
J-202 *	Plug	523-241-9-003
P-201	Wire Harness, W-070306	428-004-9-001
P-201 *	Wire Harness	428-003-9-001
P-202	Wire Harness, W-070304	428-004-9-002
P-202 *	Wire Harness	428-003-9-002
J-701	Antenna Cord, WZ-079	426-055-9-001
P-702	Cord Spk/Power, WZ-083 (P/P Radio)	426-055-9-002
J-702	Cord Spk/Power, WZ-084 (P/O Spk)	426-055-9-003
PL-701, 702	Pilot Lamp, PL-086	400-061-9-001
	Terminal Strip TP-013	345-051-9-001
P-101, 102	Terminal Check Point, TP-033	757-037-9-001
	Clamper, Wire, YY-047	380-278-9-001
	Wire Connector, YY-008	763-083-9-001
	Fuse, FS-001 4A	191-251-3-004

**CIRCUIT
SYMBOL**

DESCRIPTION

**DYNASCAN
PART NO.**

MISCELLANEOUS CONTINUED

Capacitor, Noise-Suppress, CZ-035	033-044-9-001
Resistor, Noise-Suppress, RZ-004	013-026-9-002
Side Chassis (R)	258-039-9-001
Side Chassis (L)	258-040-9-001
Deck Holder	251-367-9-001
Rear Chassis	258-041-9-001
(Volume Bracket) *	251-368-9-001
Volume Bracker	251-372-9-001
Heat Sink	747-071-9-001
LED Holder *	251-369-9-001
Cord Clamp	741-109-9-001
Sw Lever *	763-126-9-001
Bottom Cover	252-030-9-001
Spring Plate *	767-060-9-001
Front Chassis	254-034-9-001
Tuner Holder	251-370-9-001
Top Cover	253-075-9-001
Radio Chassis	257-113-9-001
Pointer Angle *	261-080-9-001
Pointer Angle	261-081-9-001
Pointer Lever	261-086-9-001
Pointer Lever *	261-081-9-001
Shaft Stopper	251-373-9-001
Pointer Bracket (Comp.) *	251-371-9-001
RV Mtg. Bracket	261-073-9-001
Guide Pin *	763-126-9-002
Crank	763-123-9-007
Pointer Shaft	763-127-9-001
Tuning Shaft (Ass'y.)	523-241-9-004
Tuning Shaft	763-126-9-003
Cross Shaped Plate	763-123-9-008
Crank	763-123-9-007
Spring Pin	763-126-9-004
Door Shaft	763-127-9-002
Door Shaft *	763-126-9-005
Escucher *	763-127-9-003
Escucher *	763-126-9-006
Dial Scale	260-184-9-001
Dial Scale	260-180-9-001
Eject Knob	751-174-9-001
Slide Knob	751-173-9-001
Balance Knob	751-174-9-002
Balance Knob *	751-173-9-007
Pointer	751-174-9-004
Pointer *	751-126-9-007
Insert *	758-026-9-001
Push Knob	751-173-9-003
Push Button	751-173-9-004
Holder Lamp	251-374-9-001
LED Cover	253-077-9-001
Dial Window *	763-126-9-008
Dial Front Plate	260-185-9-001
Door *	763-126-9-009
Plate (A)	261-082-9-001
Plate (B)	261-083-9-001
Plate (C)	261-084-9-001
Back Plate	261-087-9-001
Optical Shielding Plate	256-083-9-001
Trimmer Label (A)	483-347-9-001
Azimuth Label *	483-347-9-002
Label (D)	483-348-9-001
Label (C) *	763-095-9-008
Label (B)	483-327-9-004
Cushion	503-165-9-001
Door Spring *	767-060-9-002
Door Spring	767-061-9-001
Insulation Plate	261-085-9-001
Optical Shielding Cloth	763-127-9-006
Lug Terminal	741-100-9-001
Pan Hd. Screw M2x4 Ni.	634-091-9-001
Bind Hd. Screw M2x4 Ni.	634-069-9-002

*Model 98C7J, only

ALIGNMENT PROCEDURES

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

EQUIPMENT REQUIRED

1. Power Supply (14V DC)
2. AC V.T.V.M.
3. AM & FM RF Signal Generator
4. Sweep Generator (455kHz - 10.7MHz)
5. Oscilloscope
6. FM Stereo Modulator
7. Digital Frequency Counter

AM

STEP	ADJUSTING CIRCUIT	CONNECTIONS		FREQ'CY	DIAL SETTING	ADJ.	ADJUST FOR
		INPUT	OUTPUT				
1	AM IF	Connect Sweep Generator to test point A & gnd to chassis (SIGNAL LEVEL LOW)	Connect Scope to test point C & ground to chassis	455kHz	Lowest End	T403,404, T502,503	Max. & symmetrical pattern on scope (see Fig. 1)
2	Coverage	Connect AM Signal Gen. to Ant. receptacle through matching pad (Fig. 4)	Connect VTVM to spkr output on either CH.	1400kHz	1400kHz	C501 ANT. Trimmer Fig. 2	Max. output
3	Repeat adjustments for best results.						

FM

1	FM IF	Connect sweep generator to test point A & Gnd to chassis (SIGNAL LEVEL LOW)	Connect scope to test point B & gnd to chassis	10.7MHz	Lowest End	T401	(set receiver to FM-DX) Wave pattern on Fig. 3
NOTE: The 10.7 MHz marker need not be in center position on scope-wave form.							
2	FM OSC	Connect FM signal Gen. to ANT. receptacle	Connect VTVM to spkr output of either CH.	109MHz	Highest End	C421	Max. Reading on V.T.V.M.

MPX

- (A) Connect a digital frequency counter to test point **D**, then adjust R526 (SVR) for a reading of 19 kHz.
- (B) Connect FM signal generator and signal modulator to antenna receptacle, set stereo modulator to 7.5kHz deviation (10%) for pilot signal (19kHz) and 65.5kHz deviation (90%) for L & R main signal. Set FM signal generator to 98MHz, 1mV, 75kHz deviation (100%).
- (C) Turn Mode selector of stereo modulator to L or R, and obtain more than 30dB of chanel separation by adjusting R532 (SVR). Also confirm that stereo indicator lamp of receiver goes ON and OFF when STEREO/MONO switch is operated.

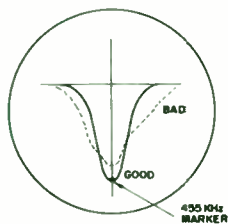


Fig. 1

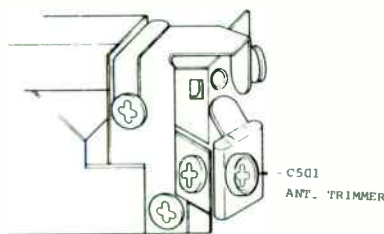


Fig. 2

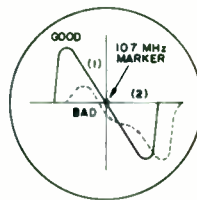


Fig. 3

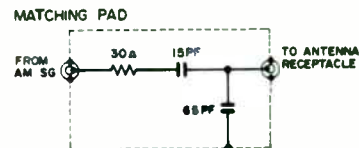
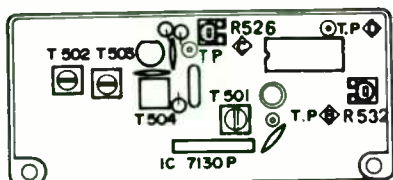
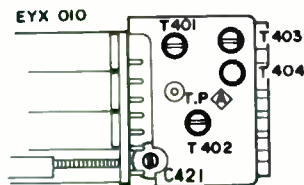


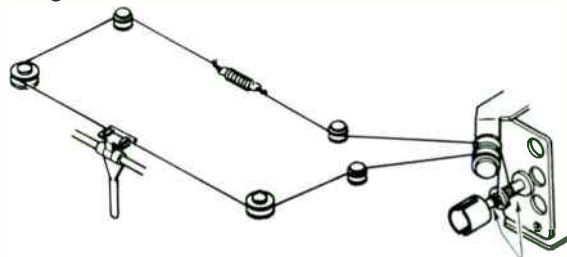
Fig. 4



IF/MPX P.C.B.



RF TUNER



DIAL CORD STRINGING

3 turns

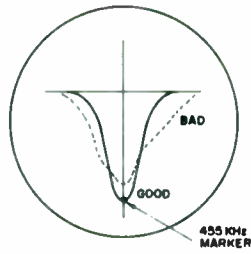


Fig. 1

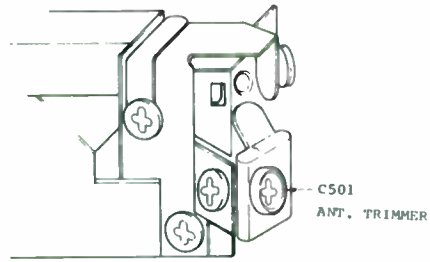


Fig. 2

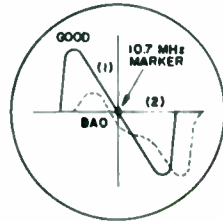


Fig. 3

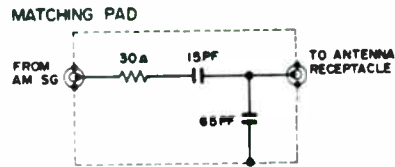
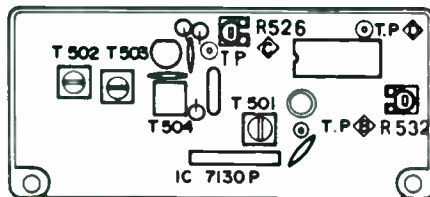
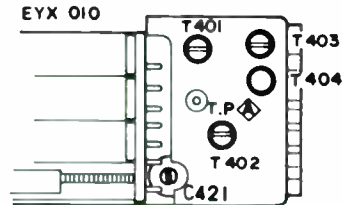


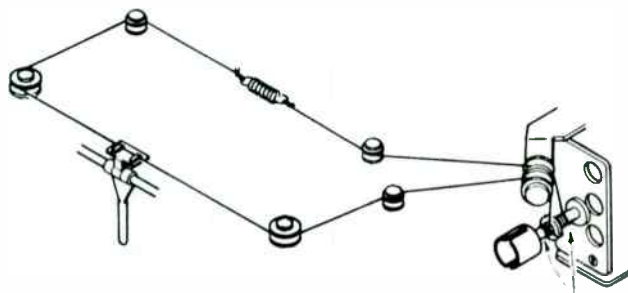
Fig. 4



IF/MPX P.C.B.



RF TUNER



DIAL CORD STRINGING

A D J U S T M E N T S

CROSSTALK

Insert a standard test cartridge. In PLAY mode, set unit to program "3" and adjust the head height adjust nut (Ref. 19 on mechanism exploded view) for minimum output.

HEAD AZIMUTH

Insert standard azimuth cartridge. In PLAY mode, adjust the azimuth adjust screw (Ref. 71 on mechanism exploded view) for maximum output.

Ref. No.	Craig Key No.	Description	Mfr's Sugg Ret. Price	Ref. No.	Craig Key No.	Description
P A C K A G I N G						
	S680001	Individual Carton			S680006	Ass'y, Trim Plate(Complete)
	S680002	Styrofoam (L)			S680007	Trim Plate (stripped)
	S680002	Styrofoam (R)			S680008	Index Label (R)
	S680004	Sub-Filler Pad			S680009	Index Label (L)
	S680005	Carton Filler, Poweplay Amp			3149052	Ass'y, 9P Connector (power)
	3128054	Bkt, Perforated Mtg Strap			3149004	Mtg Hardware Kit
	9744100	Gasket			3148020	Knob, TONE/SENSITIVITY SELECT
	3143006	Fuse, 5A			3148021	Knob, VOLUME/TUNING
C A B I N E T						
102	S680015	Ass'y, Front Escutcheon		76	3128043	Washer, Cont Mtg
103	S680016	Ass'y, Door Mtg Chassis		77	3148119	Lock Washer
104	S680017	Stud (A), P.C.B. Mtg		78	3148117	Nut, Cont Mtg
105	S680018	Holder, Scale Lamp		151	S680038	Bottom Cabinet(powerplay Amp)
106	S680019	Collar, Switch Mtg		152	S680039	Clamp, Powerplay Cord
108	S680020	Ass'y, Cartridge Door		601	S680040	Ass'y, IF/MPX PCB W/Comp
109	S680021	Spring, Cartridge Door		602	S680041	Ass'y, Pre-Amp P.C.B. W/Comp
110	S680022	Shaft, Cartridge Door		603	S680042	Feed Thru Capacitor, 1000pF
111	S680023	Slide, Pointer Guide		604	S680043	Connector Cord, powerplay Amp
112	S680024	Dial Pointer		605	S680044	P.C.B., for Lamps
113	S680025	Ass'y, Trimmer Mtg		606	S680045	Ass'y, Ind. Bushing W/Lamps
114	S680026	Ass'y, Pinion Shaft Joint			S680046	Lamp only, Program Indicator
115	3149037	Cross Plate, Pinion Shaft		607	3149012	Female Antenna Receptacle
116	S680027	Ass'y, Dial String Spring		608	S680047	Ass'y, Antenna P.C.B.
117	S680028	Bottom Cabinet		609	3516038	Antenna Trimmer, 60pF
118	3148118	Washer, Volume Control		610	3148045	Lamp, Dial Scale
119	S680029	Button, FM/AM Select		611	S680048	Ass'y, RF Tuner W/Comp
120	S680030	Button, Repeat		612	S680049	Slide VR 20k, BALANCE Cont
121	S680031	Button, Balance		613	S680050	Push Switch, Repeat & AM/FM
122	S680032	Fiber Insulator		614	S680051	Switch P.C.B.
123	S680033	Cord Bushing		615	S680052	VR 20k, VOL/TONE, W/S1 & S4
125	S680034	Top Cabinet		616	S680053	Sw, LOC/DX/MONO W/Tuner Shaft.
126	3148015	Cap, Hd Adj Hole		617	S680054	Ass'y, Main Amp PCB W/Comp
127	S680035	Plate, Light Intercept		618	NSP	Heat Sink **
128	S680036	Pad, Light Intercept		619	S680055	Cord Connector, Main Supp.
150	S680037	Top Cabinet, Powerplay AMP		620	3149005	Ass'y, 9P Female Connector
					S680088	Ass'y, Powerplay Booster
M E C H A N I S M						
1	NSP	Ass'y, Mechanism Chassis	**	15	S680065	BELT
2	S680056	Ass'y, Hd Base Mtg Plate		16	S680066	Spacer, Cartridge Guide
3	S680057	Head Housing		17	S180085	Top Spring, Cam
4	S180088	Spacer, Head Mtg		18	3148095	Spring, Cam Push-Up
5	3148096	Spring, Head Azimuth Adj		19		Hd Hght Adj Nut, M3
6	S180090	Ratchet Support		20	3148098	Spr, Program Change Solenoid
7	S180091	Ratchet Claw		21	S680067	Ass'y, Top Chassis
8	S680058	Ass'y, Prog. Change Cam		501	3148053	HEAD
9	S680059	Ass'y, Tape Guide		502	S180089	SOLENOID, Program Change
10	S680060	Motor Pulley		503	S680068	MOTOR
11	S680061	Ass'y, Cart-Retainer Spring		504	S680069	Switch, RADIO/TAPE
12	S680062	Bearing, Flywheel Capstan		505	S180082	P.C.B., Prog. Ind Lamp Sw
13	S680063	FLYWHEEL		506	S680070	Ass'y, Filter P.C.B.
14	S680064	Tape Protector Insert				
M I S C E L L A N E O U S & E L E C T R I C A L						
R526	S680071	Semi-Var Res, 3.3k Ohms		VR1,101	S680052	VR 20k, TONE Control
S2	S680069	RADIO/TAPE Switch		VR2,202		VR 20k, VOLUME Control
S3	S680059	Tape Sensor Switch		S1		Power Switch
S4		See Volume Control		S4		Program Switch (manual)
S5	S18C082	P.C.B. Sw, Program Lamp		VR3		Slide VR 20k, BALANCE Cont.
S6	S680053	MONO/STEREO & LOC/DX Sw.			S680046	Lamp, Program Indicator
S7	S680050	REPEAT Switch			3148045	Pilot Lamp 14V, Dial
S8	S680050	AM/FM Select. Switch			S680046	Lamp, STEREO Indicator
G501	3148142	Neon Lamp		R532	S680072	Semi-Var Res, 1k Ohms
S E M I C O N D U C T O R S						
D1,1Q1	1S953	Diode		IC2,102	TA7205P	I.C., Amp
D501,502	1S953	Diode		IC501	TA7130P	I.C., IF
D503,504	1S953	Diode		IC502	LA3350	I.C., MPX
D505,506	1S953	Diode		Q1,101	2SC644	Transistor
D507,508	1S953	Diode		Q2,102	2SC828	Transistor
D2	10D2	Diode		Q501,502	2SC829	Transistor
D509	MZ310A	Zener Diode		Q503,504	2SC1317	Transistor
IC1,101	TA7205P	I.C., Amp		Q403	2SC1675	Transistor
Q401,402	2SC668	Transistor		Q404,405	2SC941	Transistor
C O I L S , T R I M M E R S & T R A N S F O R M E R S						
C501	3516038	Trimmer Cap, 60pF		T401	S680080	IF Can
C421	S680073	Trimmer Cap		T402	S680081	AM OSC
CF501,502	S680074	Ceramic Filter(SFE-10.7MHz)		T403	S680082	AM IFT
CR501	S680075	CR Component(F942Z102)		T404	S680083	AM IFT
L1	S180103	Choke Filter (ELX002)		T501	S680084	IFT 10.7 MHz
L404	S680076	RF Coil		T502	S680085	IFT 455 kHz
L405	S680077	RF Coil		T503	S680086	IFT 455 kHz
L409	S680078	Coil, 4.7 uH		T504	S680087	IFT 455 kHz
L501	S680079	Micro Inductor, 6.8uH				

NOTE NSP: Non-Serviceable Part

C A P A C I T O R S

Ref. No.	Description	Mfr's Sugg Ret. Price	Ref. No.	Description	Mfr's Sugg Ret. Price
C1,101	Polyester,	0.001uF/50V	C127,128,129	Electrolytic,	1000uF/16V
C505,506,	"	0.01uF/50V	C515	Ceramic,	3pF/50V ±0.5pF
C507	"	0.01uF/50V	C531	"	22pF/50V ± 10%
C3,103	"	0.015uF/50V	C15,16,21,	"	47pF/50V " "
C527,528	"	0.033uF/50V	C22,115,116,	"	47pF/50V ± 10%
C19,20,119,	"	0.047uF/50V	C121,2122	"	47pF/50V " "
C120,523	"	0.047uF/50V	C532	"	100pF/50V " "
C521	"	0.068uF/50V	C518	"	220pF/50V " "
C5,11,12,105	Electrolytic,	1uF/50V	C512	"	0.01uF/50V +80 -20%
C111,112,526,	"	1uF/50V	C503,516	"	0.02uF/50V " "
C529	"	1uF/50V	C6,106,	"	0.1uF/12V
C2,102,511	"	4.7uF/25V	C517,519	"	0.1uF/12V
C4,104,514	"	10uF/16V	C25,26,	"	0.2uF/12V ± 20%
C530	"	33uF/10V	C126,509	"	0.2uF/12V " "
C13,14,23,24,	"	47uF/10V	C522	Polyethylene,	1500pF/50V ± 10%
C113,114,123,	"	47uF/10V	C525	Solid Aluminum,	0.22uF/16V
C124	"	47uF/10V	C524	"	0.47uF/50V
C7	"	220uF/10V	C513	Ceramic,	0.1uF/12V
C17,18,117,118	"	220uF/6.3V	C125	Ceramic,	0.2uF/12V ± 20%
C8,27,28,29	"	1000uF/16V			

Ref. No.	Description	Ref. No.	Description	Ref. No.	Description	Ref. No.	Description
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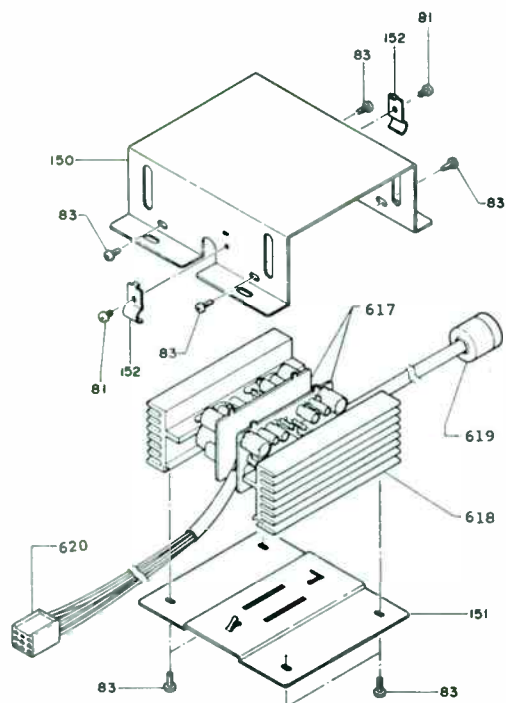
R E S I S T O R S, CARBON, OHMS, ± 5%, 0.25¢ OR NOTED

R12	3.3 Ohms, ½W	R533	680 Ohm, ½W	R529,530	3.3k Ohm, ½W	R536	22k Ohm, ½W
R501,507	47 Ohm, ½W	R503,519	1k " "	R540	3.3k " "	R518	33k " "
R10,110,	120 Ohm, ½W	R515	1.5k Ohm, ½W	R11,523	4.7k " "	R101,539	47k Ohm, ½W
R11,111	120 " "	R4,8	2.2k " "	R6,106,521	6.8k " "	R5,7	100k Ohm, ½W
R2,14,	220 " "	R104,108	2.2k " "	R525	8.2k " "	R105,107	100k " "
R102,531	220 " "	R513,514	2.2k " "	R3,103	10k " "	R522,535	100k " "
R502,505	330 " "	R534	2.2k " "	R510,511	10k " "	R504,512	150k " "
R506,538	330 " "	R517,524	3.3k Ohm, ½W	R516	10k " "	R508	1M " "
R520	470 Ohm, ½W	R527,528	3.3k " "	R9,109	22k " "	R537	1k Ohm, 1/8W

H A R D W A R E 0.25¢ OR NOTED

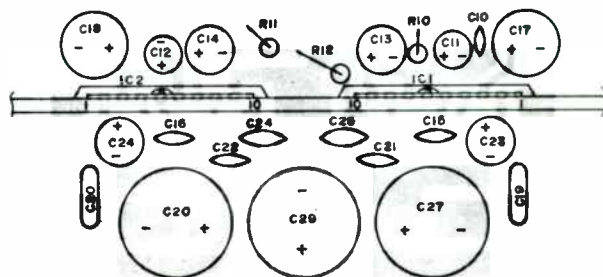
60	Bind Scr, M2x4	66	Bind Scr, M3x5	72	Hex Nut, M2.6	78	Volume Nut, 3/8"x12.5
61	Scr, PH M2x6	67	" " M3x6	73	Flat Rivet M2.5x4	79	Lug Terminal
62	Bind Scr, M2x8	68	Tap Scr, PH M3x5	74	E Ring, M3.2x10.5	80	Wire Clamp
63	" " M2.6x4	69	" " PH M3x6	75	Plain Washer, M10x3.4	81	Blk Scr, BH M3x5
64	" " M2.6x8	70	Scr, PH W/W M3x6	76	" " 3/8"x16	82	Tapp Scr, M3x5
65	" " M3x4	71	Hex Scr, M3x12	77	" " 3/8"x17.5	83	Tapp Scr, M3x8(Blk)

POWERPLAY™ AMP

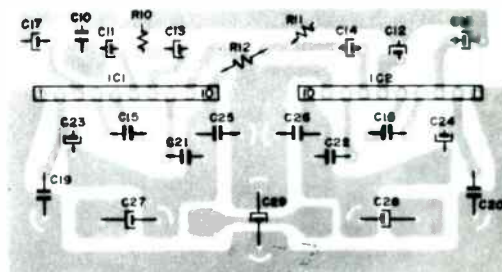


AMP P.C.B. LAYOUT

(Top View)

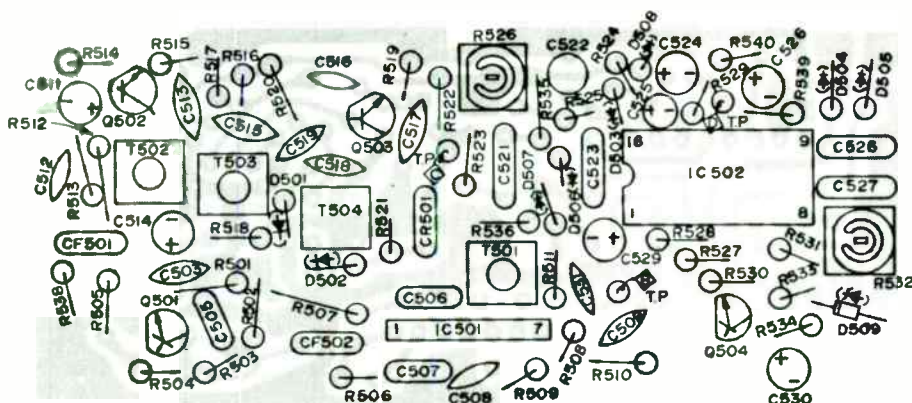


(Bottom View)

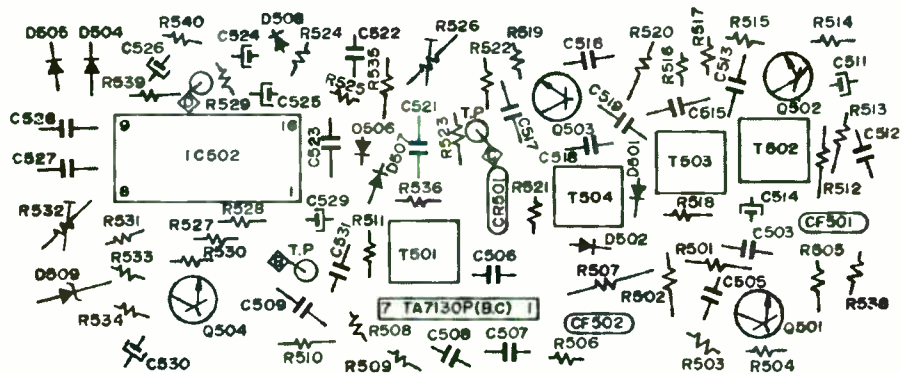


IF/MPX P.C.B. LAYOUT

(Top View)

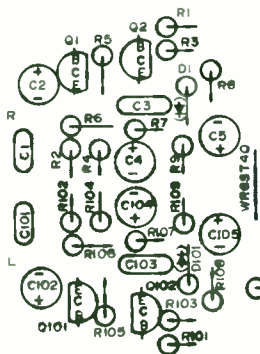


(Bottom View)

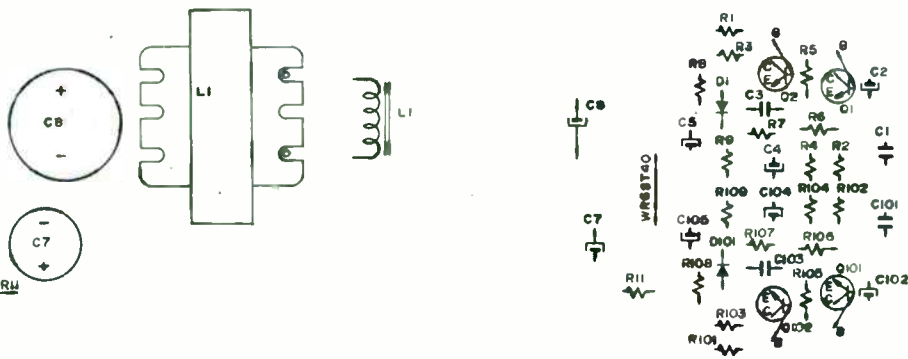


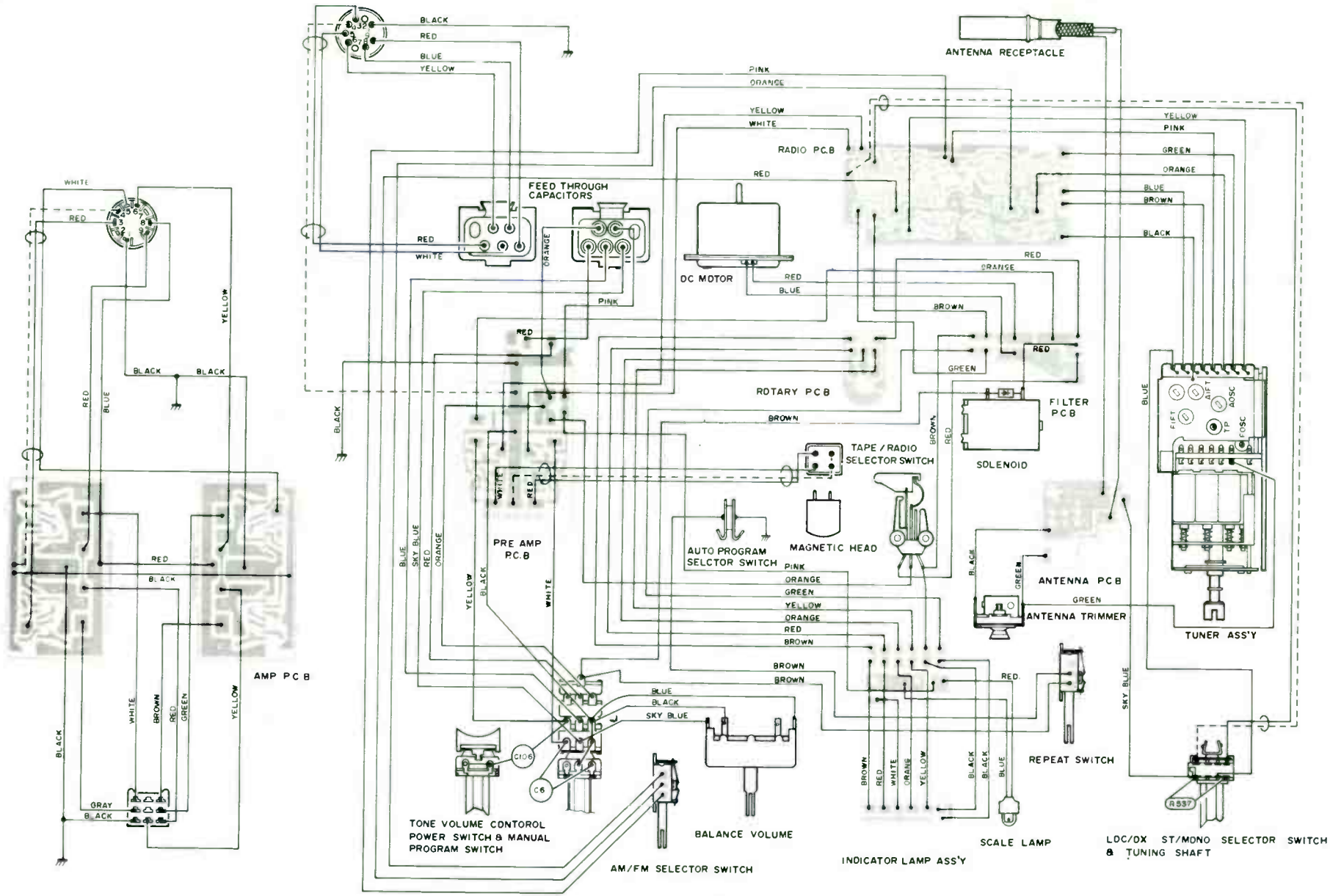
PRE-AMP P.C.B. LAYOUT

(Top View)



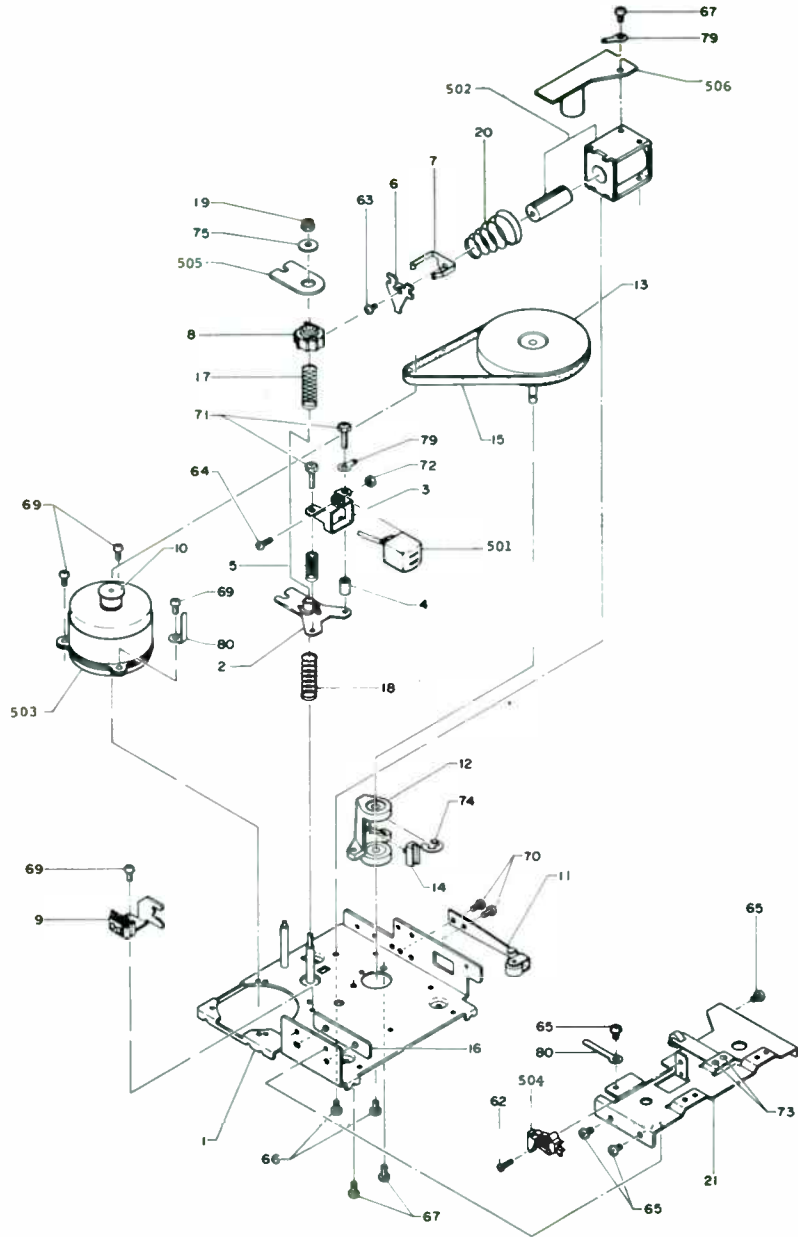
(Bottom View)



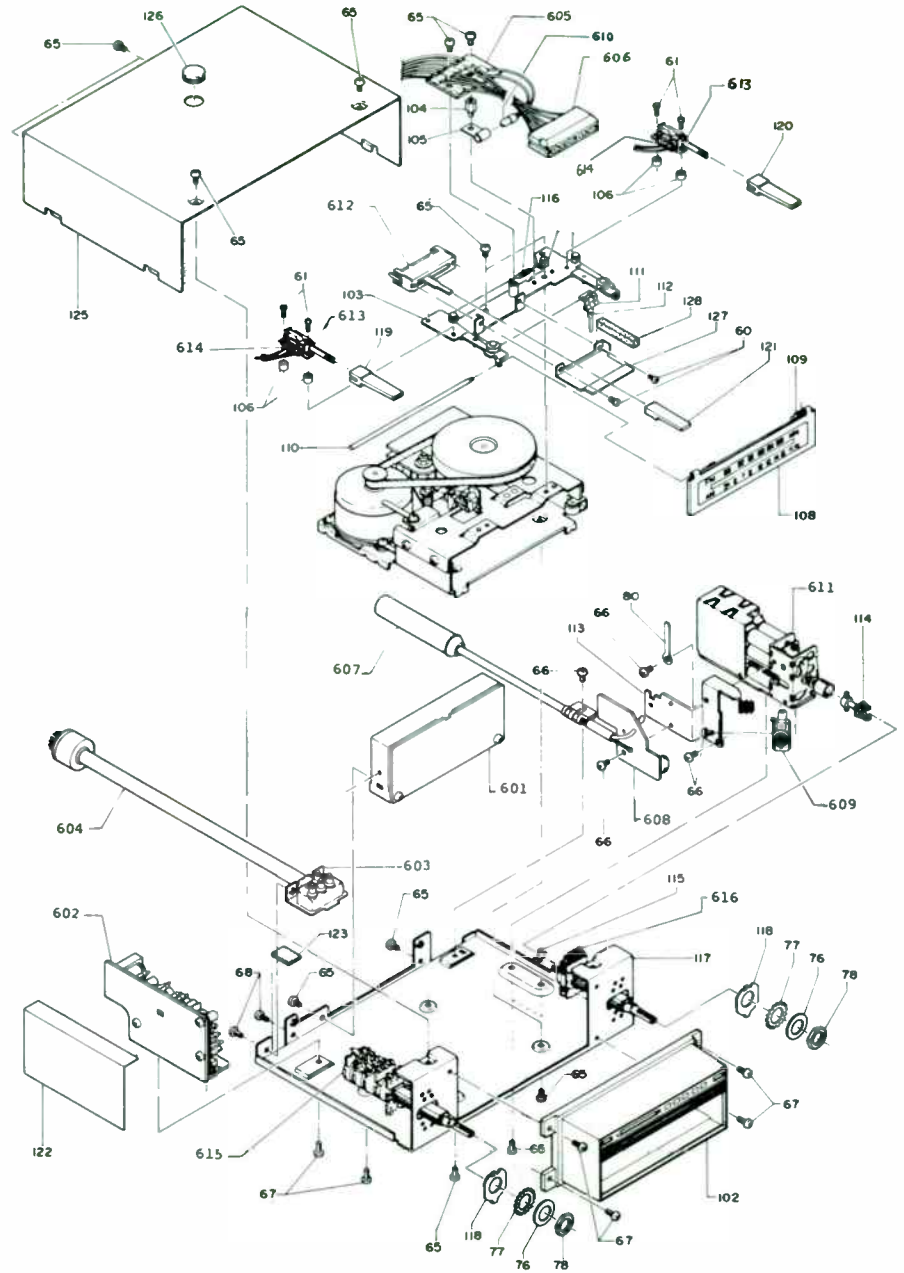


Craig S680

MECHANISM



CABINET



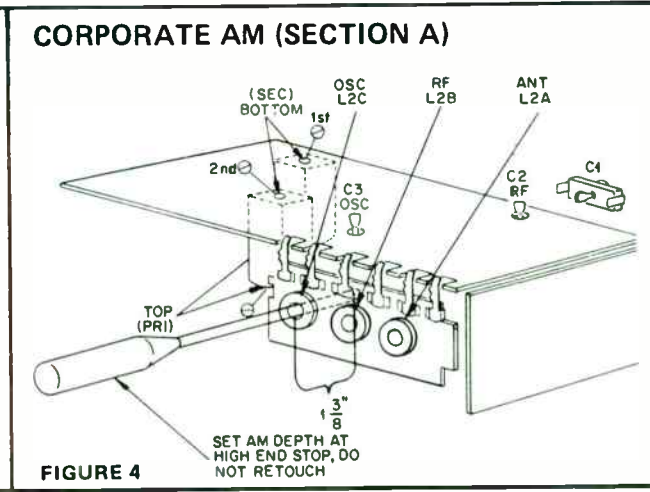
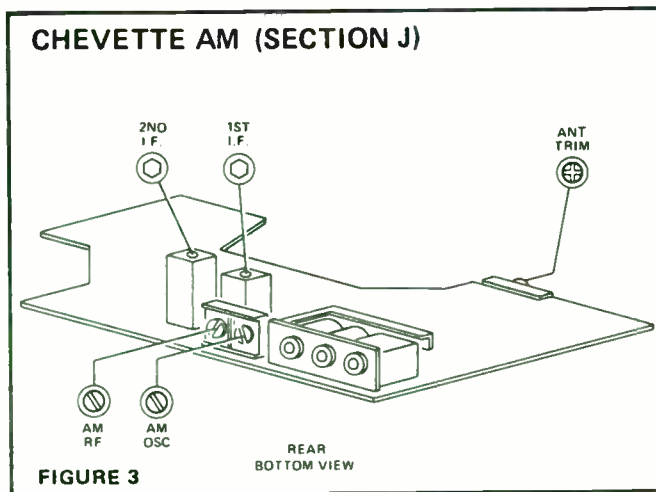
TURN VOLUME CONTROL FULLY CW. CONNECT AC VOLTMETER ACROSS SPEAKER LEADS. KEEP INPUT SIGNAL FROM SIGNAL GENERATOR LOW TO MINIMIZE AGC ACTION.

USE FIGURES 2-6

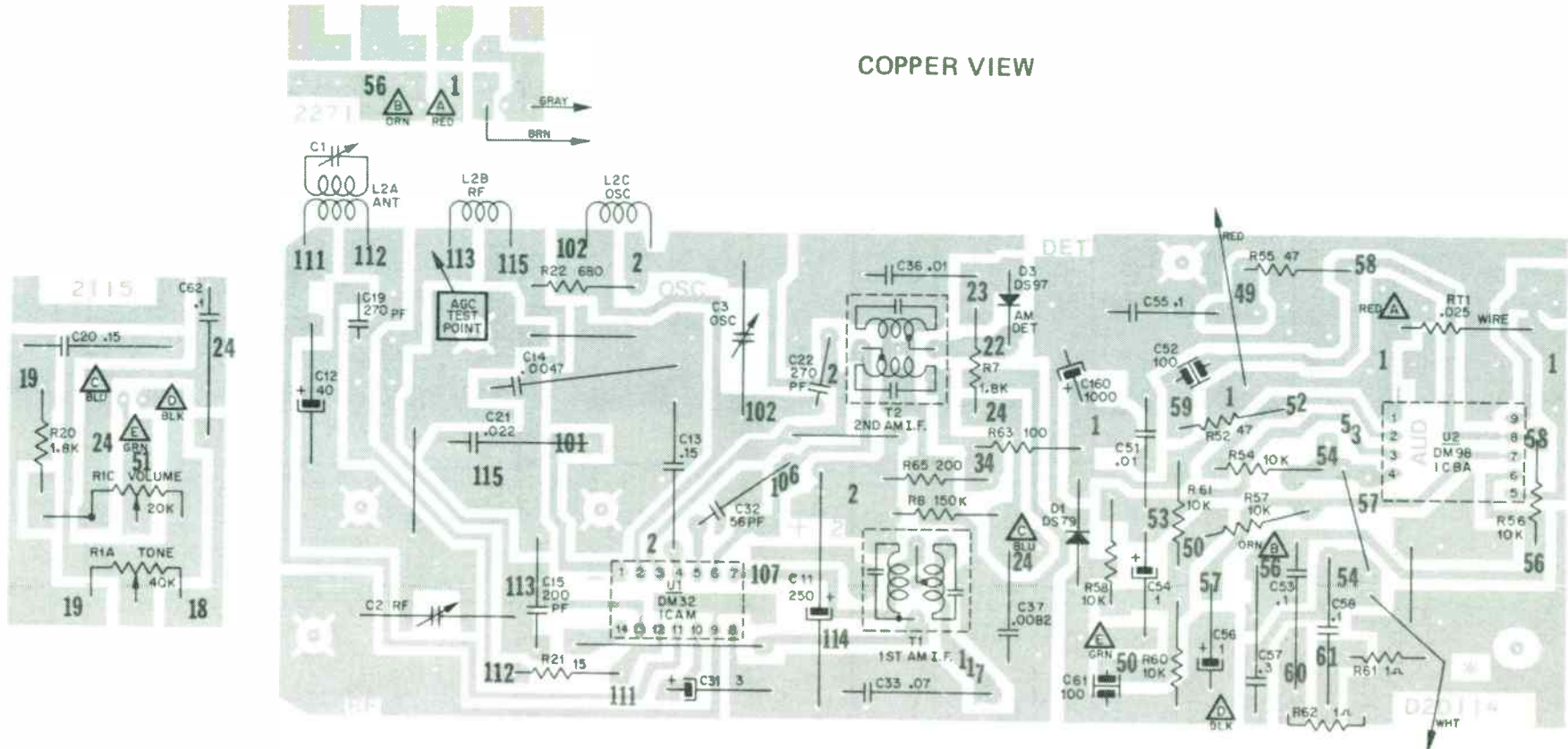
AM ALIGNMENT PROCEDURE

STEP	GENERATOR FREQUENCY	GENERATOR COUPLING	TUNER SETTING	ADJUST FOR PEAK
1	MODULATED 262 KHZ	THRU - 1MFD. INTO ANTENNA SOCKET	HI-END STOP	1ST SECONDARY 2ND SECONDARY 1ST PRIMARY 2ND PRIMARY
2*	MEASURE DEPTH OF OSC. CORE WITH RADIO TUNED TO HI-END STOP. SHOULD BE 1 3/8".			
3	MODULATED 1615 KHZ	THRU 82 PF INTO ANTENNA SOCKET	HI-END STOP	TRIMMER
4*	MODULATED 600 KHZ	THRU 82 PF	600 KHZ	CORES*

*EXCEPT CHEVETTE



COPPER VIEW



DM-32

1	2	3	4	5	6	7	8	9	10	11	12	13	14
5.2V	7.3V	7.3V	5.1V	0.25V	11.5V	0.7V	0V	0V	0.6V	0.6V	0.6V	4V	7.3V

DM-98

PIN	VOLTAGE
1	14
2	7
3	7
4	7
5	14
6	7
7	7
8	7
9	14

VOLTAGES MEASURED WITH A VTVM NO SIGNAL AND 14 VOLTS APPLIED TO RADIO.

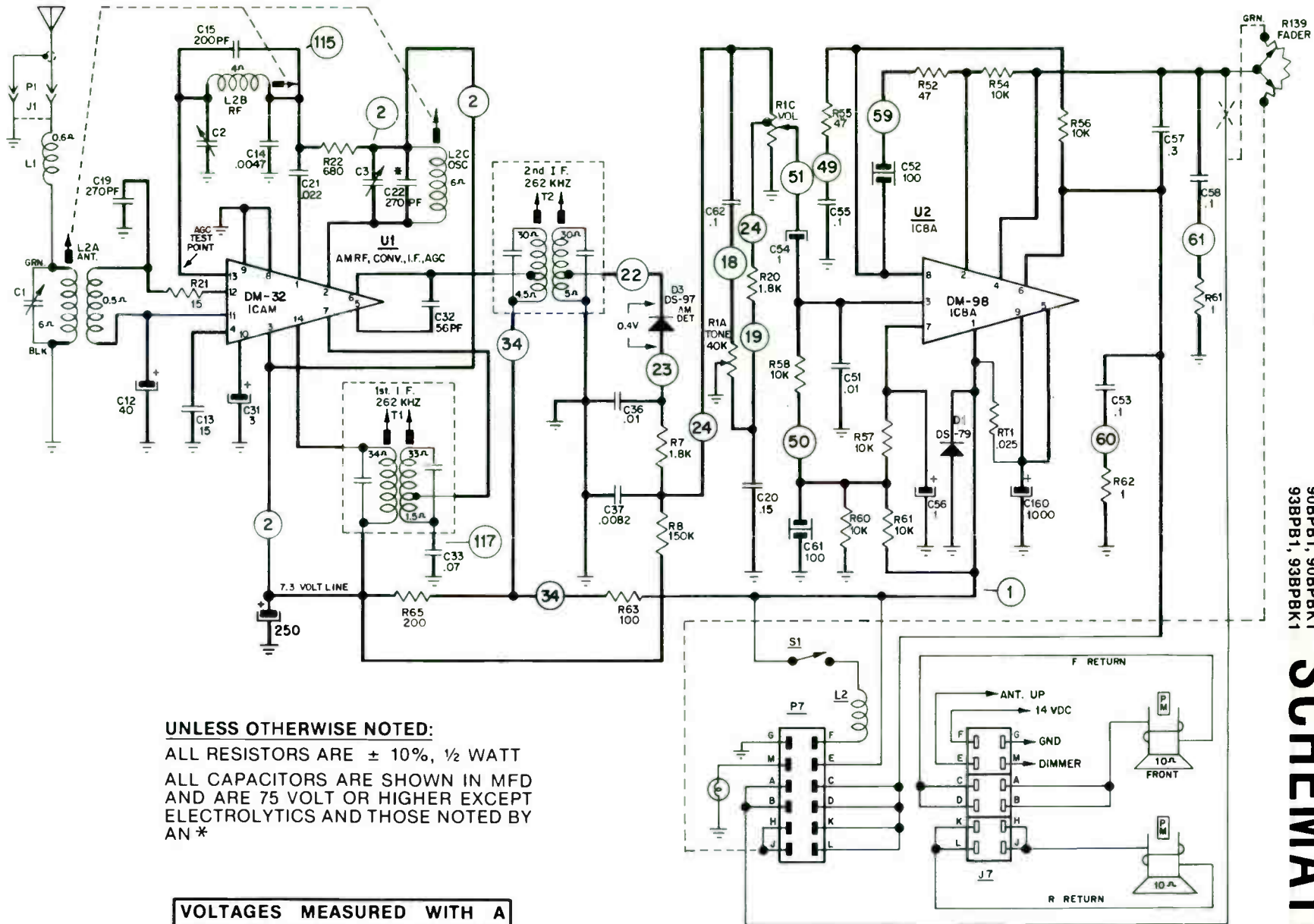
NOTICE

WHEN MAKING VOLTAGE MEASUREMENTS AROUND THE DM-32 MAKE CERTAIN TO TOUCH ONLY ONE ISLAND AT A TIME.

UNLESS OTHERWISE NOTED:

ALL RESISTORS ARE ± 10%
 ALL CAPACITORS ARE SHOWN IN MFD AND ARE 75 VOLT OR HIGHER EXCEPT ELECTROLYTICS AND THOSE NOTED BY AN *

*SPECIAL CAPACITORS, SEE PARTS LIST



UNLESS OTHERWISE NOTED:

ALL RESISTORS ARE $\pm 10\%$, $\frac{1}{2}$ WATT
 ALL CAPACITORS ARE SHOWN IN MFD
 AND ARE 75 VOLT OR HIGHER EXCEPT
 ELECTROLYTICS AND THOSE NOTED BY
 AN *

**VOLTAGES MEASURED WITH A
 VTVM NO SIGNAL AND 14 VOLTS
 APPLIED TO RADIO.**

90BPB1, 90BPBK1
 93BPB1, 93BPBK1

SCHEMATIC

Delco 90BPB1/BK1, 93BPB1/BK1

PARTS LIST

Illus. No.	Service No.	Description
SEMICONDUCTORS		
D1	DS-79	DIODE, SPIKE SUPPRESSION
D3	DS-97	DIODE, AUDIO DETECTOR, DS-97
U1	DM-32	MODULE, ICAM INTEGRATED CIRCUIT A/M RF, OSC., IF & AGC
U2	DM-98	MODULE AUDIO
COILS & TRANSFORMERS		
L1	7932356	CHOKE, ANTENNA SERIES
L2	7312805	COIL & HOUSING ASM.
L4	1221623	CHOKE 'A' SUPPLY INPUT
T1	9349015	TRANSFORMER 1ST IF
T2	9349372	TRANSFORMER 2ND IF
CAPACITORS & TRIMMERS		
C1	*16005538	TRIMMER, ANTENNA
C2	9346601	TRIMMER, RF
C3	9344489	TRIMMER, OSCILLATOR
C8	7271564	SPARK PLATE
C12	7298555	40 MFD., 6 VOLT TANTALUM
C15	7296137	200 PF., 75 VOLT CERAMIC, N750
C31	7296348	3 MFD., 12VOLT, ELECTROLYTIC
C42	7296348	3 MFD., 12 VOLT, ELECTROLYTIC
CONTROLS/RESISTORS		
R1	*16002910	CONTROL, VOLUME TONE & SWITCH
R139	7898635	CONTROL, FADER (INCL. MAN. DRIVE SHAFT BUSHING)
TUNER PARTS		
1	7314210	BACKPLATE, POINTER
2	7934009	BAR, POINTER, BELL CRANK DRIVE
3	7930918	BELL CRANK
4	9343405	BUSHING, MANUAL DRIVE SHAFT
4	7898635	BUSHING, MANUAL DRIVE SHAFT (INCL. FADER CONTROL)
6	7288147	CORE, TUNING
☆ 9	*16002141	DRIVE SHAFT AND WORM, MANUAL
9	7930920	DRIVE SHAFT AND WORM, MANUAL
10	1223052	"E" RING PKG., RETAINER(20/PKG.)
11	*16002689	ESCUTCHEON
☆ 11	*16003501	ESCUTCHEON ASM., (INCL. DIAL)

Illus. No.	Service No.	Description
TUNER PARTS		
12	1223340	FINGER BAR PKG., DECLUTCHING
14	7312801	LINK, DRIVE TO CORE BAR
15	7290329	LINK, POINTER CALIBRATION ADJ.
16	1222264	NUT PKG., SECURES CIRCUIT BOARD TO COIL HOUSING (10/PKG.)
17	1222265	NUT PKG., SECURES COIL HOUSING TO RADIO CASE (10/PKG.)
18	7279805	NUT, MANUAL & CONTROL BUSHING
19	7930919	POINTER, DIAL
20	1222745	POINTER TIP PKG., UNIVERSAL
☆ 21	9345289	PUSHBUTTON (1/PKG.) (NO.1, 3 & 5)
☆ 21	9345494	PUSHBUTTON (1/PKG.) (NO.2 & 4)
21	7932593	PUSHBUTTON (1/PKG.) (NO.2 & 4)
21	7931804	PUSHBUTTON (1/PKG.) (NO.1,3 & 5)
22	7311994	PUSHBUTTON SLIDE
23	7290330	RETAINER, POINTER CALIBRATION LINK
24	7935067	RETAINER, POINTER DRIVE BAR
25	7288537	RETAINER, BELL CRANK
28	9348785	SPRING, SHAFT TENSION
☆ 29	9348786	SPRING, DRIVE SHAFT RETAINER
29	7270344	SPRING, DRIVE SHAFT RETAINER
30	7302502	SPRING, FINGERBAR
31	7312130	SPRING, PUSHBUTTON RETURN
32	9342607	SPRING, TREADLE BEARING
33	1221501	SET SCREW & NUT PKG., TREADLE
☆ 34	16002138	TREADLE BAR ASSEMBLY
34	7313028	TREADLE BAR ASSEMBLY
35	7312805	TUNER COILS AND HOUSING
MISCELLANEOUS PARTS		
P2	*12004451	CONNECTOR, SOCKET, "A" LEAD & SPEAKER 12-PIN (ON RADIO)
J2	*1224150	CONNECTOR PKG., BENCH HOOK-UPFOR 12-PIN CONNECTOR
36	1223490	SCREW PKG., CASE
37	1223500	SCREW PKG., CIRCUIT BOARD
J1	9340526	SOCKET, ANTENNA CONNECTOR
XL1	16002673	SOCKET AND LEAD ASM., DIAL LIGHT
I1	16002741	LAMP, DIAL

ALL MODELS UNLESS OTHERWISE NOTED
 ☆ OLDSMOBILE A & B 93BPB1, 93BPBK1

COMPLETE SPEAKER LISTING

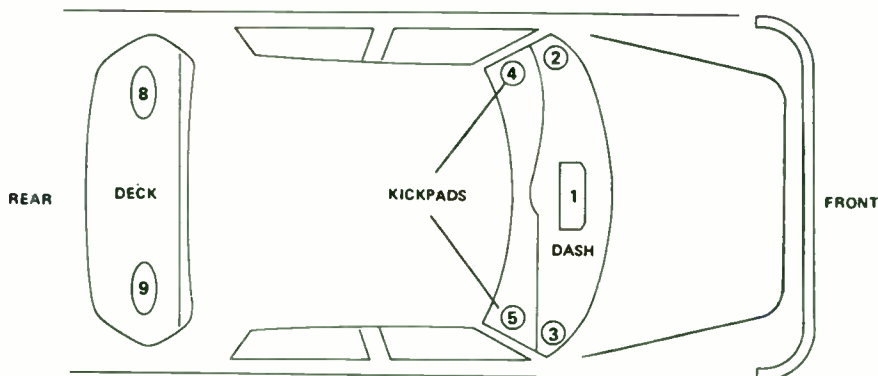
SPEAKER LOCATION GUIDE (TO BE USED WITH SPEAKER LIST)

SPEAKER CODES:

- A - 6 x 9 (Deep Basket)
- B - 6 x 9 (Shallow Basket)
- C - 4 x 10
- D - 4 x 6
- E - 3½ Round
- X - 6 x 9 Extended Range

CAR CODES:

- HATCHBACK H
- PASSENGER CARS ... C
- STATION WAGONS .. W
- TRUCKS T



CAR NAME	LOCATION & SPEAKER CODE	CAR CODE	SERVICE SPEAKER NO.	BRACKET NO.
CENTURY	2E & 3E	CW	16000680	7936043
	8A & 9A	C	9348870	
	8C or 9C	W	7898980	
LE SABRE & ELECTRA	2D & 3D	CW	16005880	7896318
	8A or 9A	C	9348870	
	8C or 9C	W	1224050	
	8X or 9X	C	16004150	
REGAL	2E & 3E	C	16000680	
	8C & 9C	C	7898980	
RIVIERA	2D & 3D	C	16005880	
	8C & 9C	C	7898980	
SKYLARK (SEE NOVA)				
SKYHAWK (SEE MONZA)				
DEVILLE AND FLEETWOOD ...	2D & 3D	C	16005880	
	8A or 9A	C	9348870	
ELDORADO	2D & 3D	C	16005880	
	8C or 9C	C	7898980	
SEVILLE	2E & 3E	C	16002296	
	8C or 9C	C	7898980	
MALIBU AND MONTE CARLO ..	1C	CW	7896870	
	8A or 9A	C	9348870	
	8C or 9C	W	7898980	
	2E or 3E	CW	16001981	
MONTE CARLO	8C & 9C	C	7898980	
CHEVETTE	9C	C	9349090	
	1A	C	9349921	
CHEVROLET	1C	CW	7896870	
	8A or 9A	C	9348870	
	8C or 9C	W	1224050	
	2D & 3D	CW	7897421	
CAMARO	1C	C	7933921	7932455
	9A	C	9348870	

COMPLETE SPEAKER LISTING

CAR NAME	LOCATION & SPEAKER CODE	CAR CODE	SERVICE SPEAKER NO.	BRACKET NO.
MONZA, SUNBIRD, SKYHAWK AND STARFIRE	1C	HCW	16002011	7930557
	9A	HC	9348870	
	9C	CW	9349690	
CORVETTE	2D & 3D	C	16005880	
	8A & 9A	C	16005641	
NOVA, SKYLARK AND OMEGA	1C	HC	9349690	7298516
	8A & 9A	C	9348870	
	9C	H	9349690	
LEMANS	1C	CW	7896870	
	8A or 9A	C	9348870	
	8C & 9C	W	7898980	
	2E & 3E	CW	7895000	
GRAND PRIX	1C	C	7896870	
	2E & 3E	C	7895000	
	8A & 9A	C	7898980	
CATALINA & BONNEVILLE	2D & 3D	CW	16005880	
	8A or 9A	C	9348870	
	8C or 9C	W	1224050	
FIREBIRD	1C	C	16004162	7932768
	9A	C	9348870	
SUNBIRD (SEE MONZA)				
PHOENIX	1C	HC	7933931	7298516
	8A & 9A	C	9348870	
	9C	H	9349690	
'88 AND 98	2E & 3E	CW	16003523	
	8A & 9A	C	9348870	
	8C or 9C	W	1224050	
CUTLASS & CUTLASS SUPREME	2E & 3E	CW	16000680	
CUTLASS	8A & 9A	C	9348870	
CUTLASS SUPREME	8C & 9C	CW	7898980	
TORONADO	2D & 3D	C	16005880	
	8C & 9C	C	7898980	
OMEGA (SEE NOVA)				
STARFIRE (SEE MONZA)				
EL CAMINO	2E & 3E	T	16001981	
	1C	T	7896870	
CHEVY PICK-UP	1C	T	7938401	
BLAZER, SUBURBAN	1C	T	7938401	
	8C or 9C	T	7938401	
STEP VAN	1C	T	7898980	
"G" VAN	2D & 3D	T	7895010	
	8A & 9A	T	9348870	
	8C & 9C	T	7938401	
STEEL TILT CAB	1B	T	7285671	
	2D & 3D	T	1222940	
ALUMINUM TILT CAB	2C & 3C	T	9349690	
	8C or 9C	T	9349690	
MEDIUM DUTY	2C & 3C	T	9349690	
	8C	T	7938401	

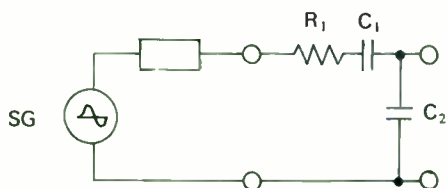
GENERAL WARNINGS FOR HANDLING UNIT

1. When removing any printed circuit board assembly out of chassis, make sure the power switch of the unit turned off. As servicing, never short-circuit conductive terminals and patterns of the circuit board GX-18, FI-04 and LS-25B chassis or short-circuit any connections on those circuit boards. Also, do not try to measure the voltage between any point on those circuit board by using ordinary multi meter, otherwise, several of those very delicate electronic components may be damaged.
2. For measuring the terminal voltage of a memoryode (MD-1B3) or DC amplifier (IC, CA-3130), an electronic volt meter of very high input impedance (100M-ohm or more) shall be used. Never touch those conductive points by a finger or tools.
3. A temperature compensation is applied for the tuning voltage of the automatic station tuning, therefore, the cut-and-try alignments of VR201 and VR202 are not recommended.

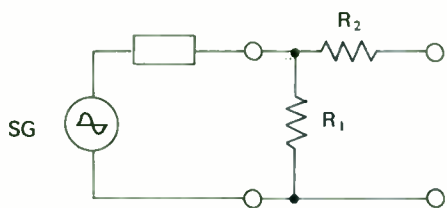
ALIGNMENT PROCEDURE

1. General condition for alignment.

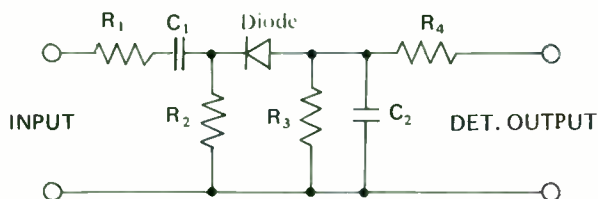
- (1) Set the volume control knob at maximum position, tone control knobs at a highest end, both fully clockwise.
- (2) Keep the output level of signal generator as low as possible unless otherwise specially noted.
- (3) Modulation degree of a signal generator shall be 30% for AM and $\pm 22.5\text{kHz}$ for FM.
- (4) Coupling dummy antenna and FM detector shall be as follows:



Dummy antenna for MW
 $R_1 = 30\Omega$ $C_1 = 15\text{pF}$ $C_2 = 65\text{pF}$



Dummy antenna for FM
 $R_1 = 75\Omega$, $R_2 = 37.5\Omega$



Detector for FM
 $R_1 = 1\text{k}\Omega$, $R_2 = 18\text{k}\Omega$
 $R_3 = 100\text{k}\Omega$, $R_4 = 10\text{k}\Omega$
 $C_1 = 30\text{pF}$, $C_2 = 300\text{pF}$

1. ALIGNMENT OF POWER SUPPLY CIRCUIT (KPB-GX-18)

STEP	ALIGNMENT ITEM	CONNECTION		ALIGNMENT POINT	VOLT METER INDICATION
		INPUT	OUTPUT		
1.	9.4V Stabilized power supply	Apply +14V to power line, negative to chassis ground.	Connect a volt-meter across TP-1 and GND.	VR-201	9.40 ± 0.05V
2.	Temperature compensation circuit for tuning voltage.	Same as above.	Connect a digital volt-meter to Memoryode (MD201) + side.	VR-202	V _{tun} = 4.00V Adjust V _{tun} to 4.00±0.02V at ambient temperature difference T = ±20°C.

Alignment of power supply circuit specified as the above requires highly trained technology, therefore, it is not recommended to try to adjust the circuit unless a set-up of highly sophisticated equipments and service informations are available. These circuits are well adjusted at a factory when assembled.

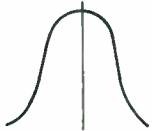


2. ALIGNMENT OF FM MPX CIRCUIT (KPB-GX21)

Set the waveband selector switch at FM stereo position, and at manual tuning position.

STEP	ALIGNMENT ITEM	CONNECTION		ALIGNMENT POINT	INDICATION OF FREQUENCY METER AND LEVEL METER
		INPUT	OUTPUT		
1.	MPX circuit	Connect the output signal of stereo modulated FM generator to the antenna terminal through a specified dummy antenna.	Connect a frequency meter across TP-2 and GND.	VR-402	f count = 19.00±0.05kHz
2.	Separation circuit	Same as above.	Connect an output level meter across the speaker terminals.	VR-401	Adjust for the maximum level difference between left and right channels, which shall be more than 25dB.

3. ALIGNMENT OF AM IF CIRCUIT (GT-13A)

Set AM/FM selector switch at AM position, and at manual tuning position.

STEP	ALIGNMENT ITEM	CONNECTION		ALIGNMENT FREQUENCY	ALIGNMENT POINT	OUTPUT WAVE FORM
		INPUT	OUTPUT			
1.	AM IF circuit (Audio output)	Apply the output of IF sweep marker generator to antenna terminal through a specified dummy antenna (frequency shall be approx. 1,600kHz).	Connect oscilloscope input across TP-3 and GND.	455kHz	T-307 T-308 T-309 T-310	
2.	AM ratio (Detector circuit)	Same as above.	Connect oscilloscope input across D312 and GND.	455kHz	T-311	
3.	AM ratio (Detector circuit)	Same as above.	Connect oscilloscope input across TP-4 and GND.	455kHz	T-312	

4. ALIGNMENT OF AM TUNER CIRCUIT (GT-13A)

Set AM/FM selector switch at AM position, and at manual tuning position.
For measuring tuning voltage, a digital volt-meter shall be connected across TP-5 and GND.

STEP	ALIGNMENT ITEM	CONNECTION		ALIGNMENT FREQUENCY AND TUNING VOLTAGE	ALIGNMENT POINT	OUTPUT WAVE FORM
		INPUT	OUTPUT			
1.	Frequency coverage	Connect the output of AM sweep marker generator the antenna terminal through a specified dummy antenna.	Connect the input of an oscilloscope across TP-3 and GND.	517kHz 1.28V 1625kHz 8.5V	T-305 TC-305	Adjust for the maximum height of wave form
2.	Tracking	Same as above.	Same as above.	600kHz 1400kHz	TC-301, 304 T-301, 304	Same as above.

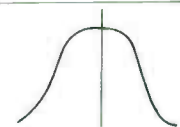

5. ALIGNMENT OF FM TUNER CIRCUIT (TF-01)

Set AM/FM selector switch at the FM position and at the manual tuning position.

STEP	ALIGNMENT ITEM	CONNECTION		ALIGNMENT FREQUENCY AND TUNING VOLTAGE	ALIGNMENT POINT	OUTPUT WAVE FORM
		INPUT	OUTPUT			
1.	Frequency coverage	Connect the output of FM sweep marker generator to the antenna terminal through a specified dummy antenna.	Connect the input terminal of the specified FM detector across TP-6 and GND, and output of the FM detector to oscilloscope input.	88MHz 1.40V 108MHz 8.00V	T-103 TC-103	Adjust for the maximum height of wave form.
2.	Tracking	Same as above.	Same as above.	88MHz 1.40V 108MHz 8.00V	T-101, T-102 TC-101, TC-102	Same as above.

6. ALIGNMENT OF FM IF CIRCUIT (F-104)

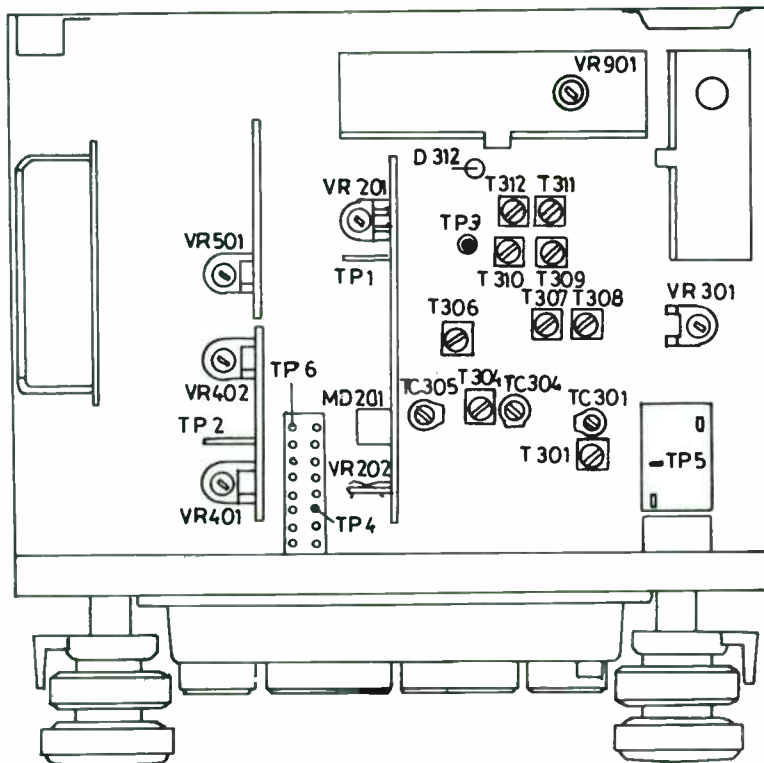
Set AM/FM selector switch at the FM position, and at the manual tuning position.

STEP	ALIGNMENT ITEM	CONNECTION		ALIGNMENT FREQUENCY	ALIGNMENT POINT	OUTPUT WAVE FORM
		INPUT	OUTPUT			
1.	IF circuit	Connect the output of FM sweep marker generator antenna terminal through a specified dummy antenna.	Connect the input of an oscilloscope across D312 and GND.	96MHz	T-104, T-901	
2.	Radio detector	Same as above.	Connect the input of an oscilloscope across TP-6 and GND.	96MHz	T-902	

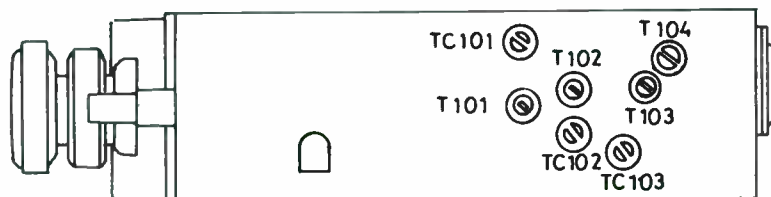
7. ALIGNMENT OF STOP SENSITIVITY OF AUTO TUNING (GT-13A, FI-104)

Set a search selector at DX-search position.

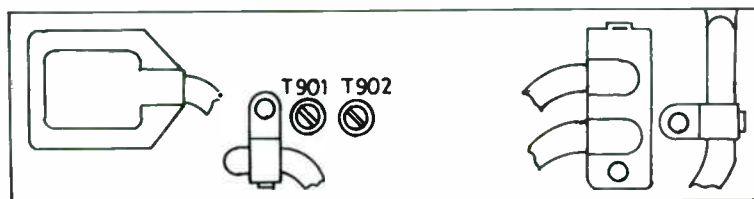
STEP	ALIGNMENT ITEM	CONNECTION		ALIGNMENT FREQUENCY	ALIGNMENT POSITION	REMARKS
		OUTPUT	INPUT			
1.	AM stop sensitivity	Connect the output of AM signal generator to antenna terminal through a specified dummy antenna.	Connect an oscilloscope input across speaker terminals.	1000kHz	VR-301	Gradually, adjust counter-clockwise so that the search stops with 25dB input measured at signal generator open loaded output.
2.	FM stop sensitivity	Connect the output of FM signal generator to antenna terminal through a specified dummy antenna.	Same as above.	96MHz	VR-901	Gradually, adjust clockwise so that the search stops with 20dB input measured at signal generator open loaded output.



UP SIDE VIEW

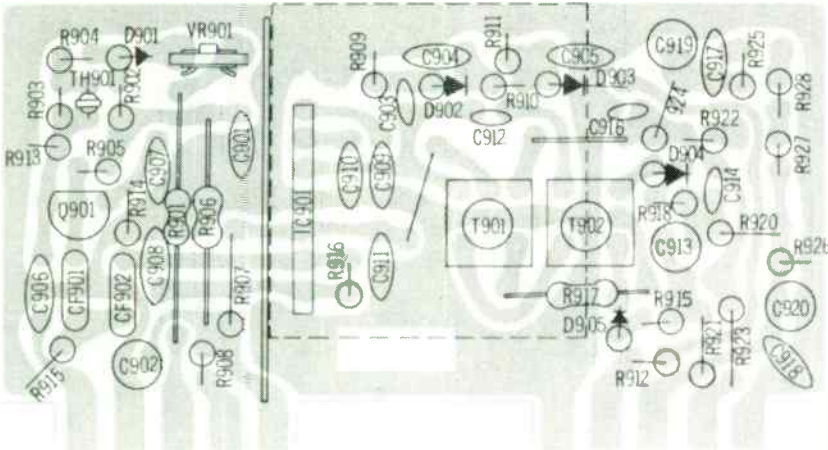


RIGHT SIDE VIEW

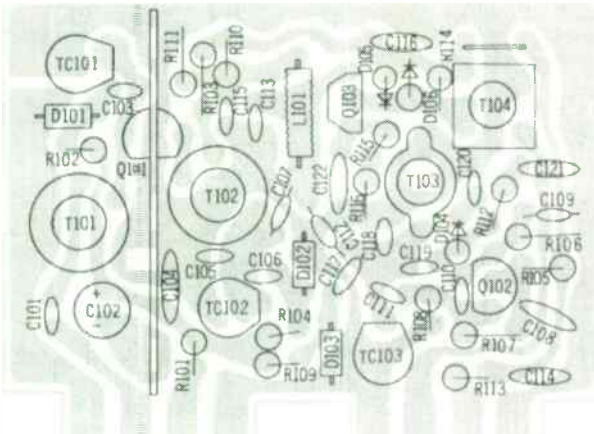


REAR VIEW

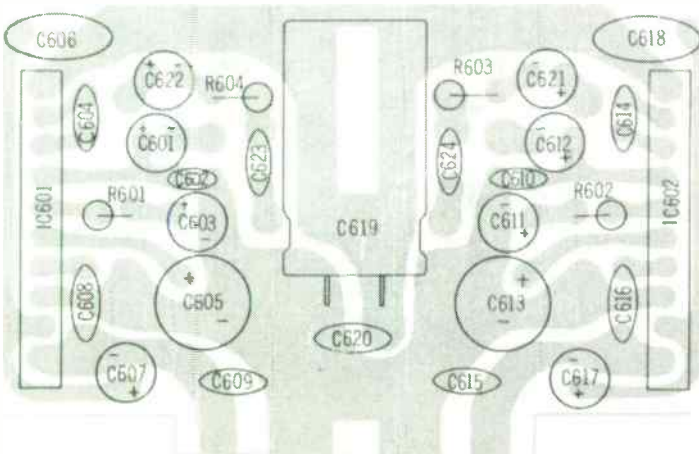
FM IF. DET. (KPB-F104)



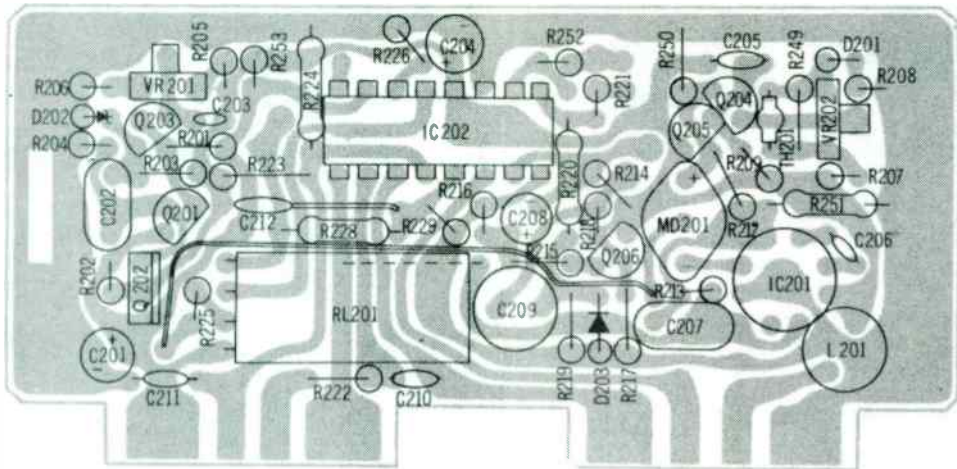
FM TUNER (KPB-TF01)



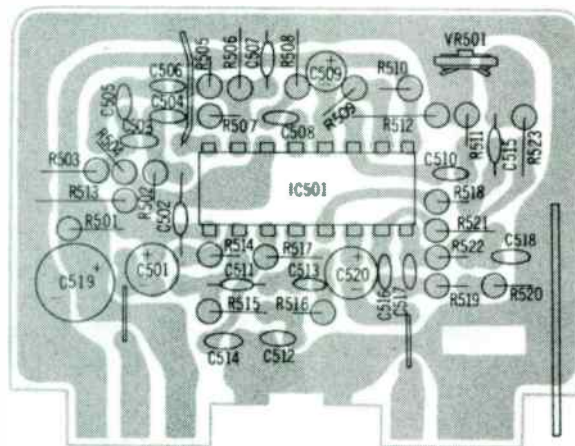
POWER AMPLIFIER (KPB-MA05B)



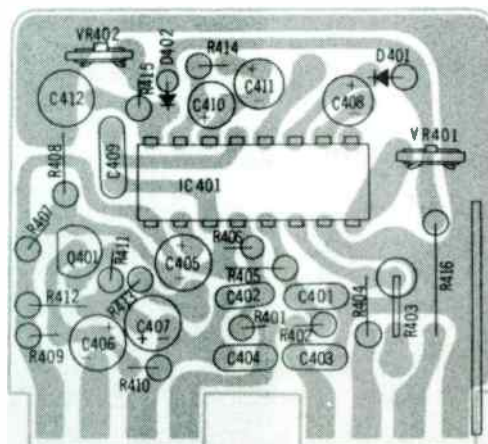
AUTO-SEARCH (KPB-GX18)



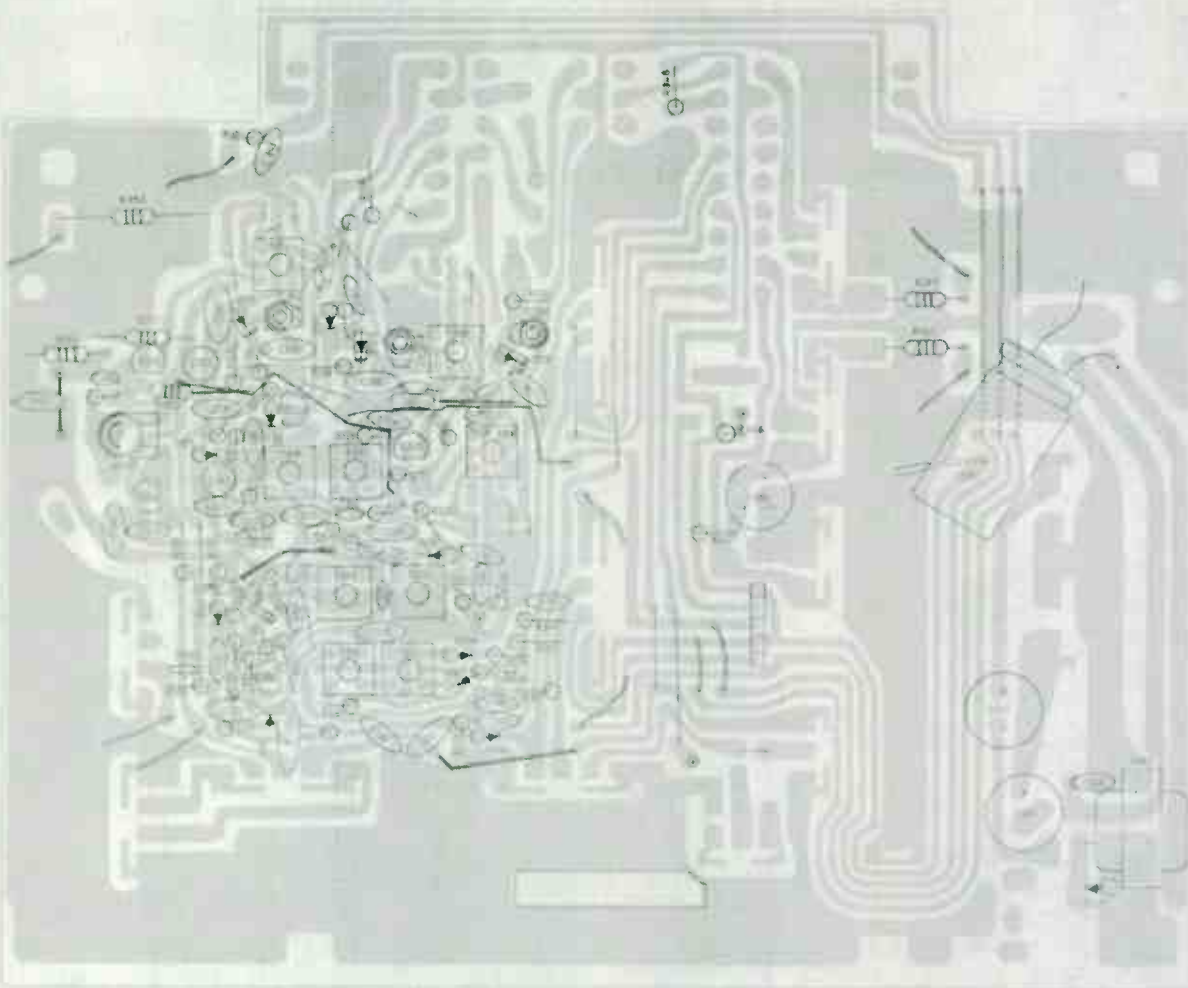
ESU (FM INTERFERENCE SUPPRESSION) (KPB-GX19)



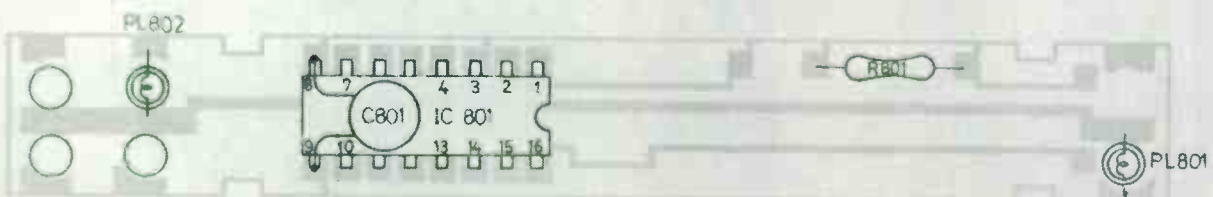
MPX (KPB-GX21)

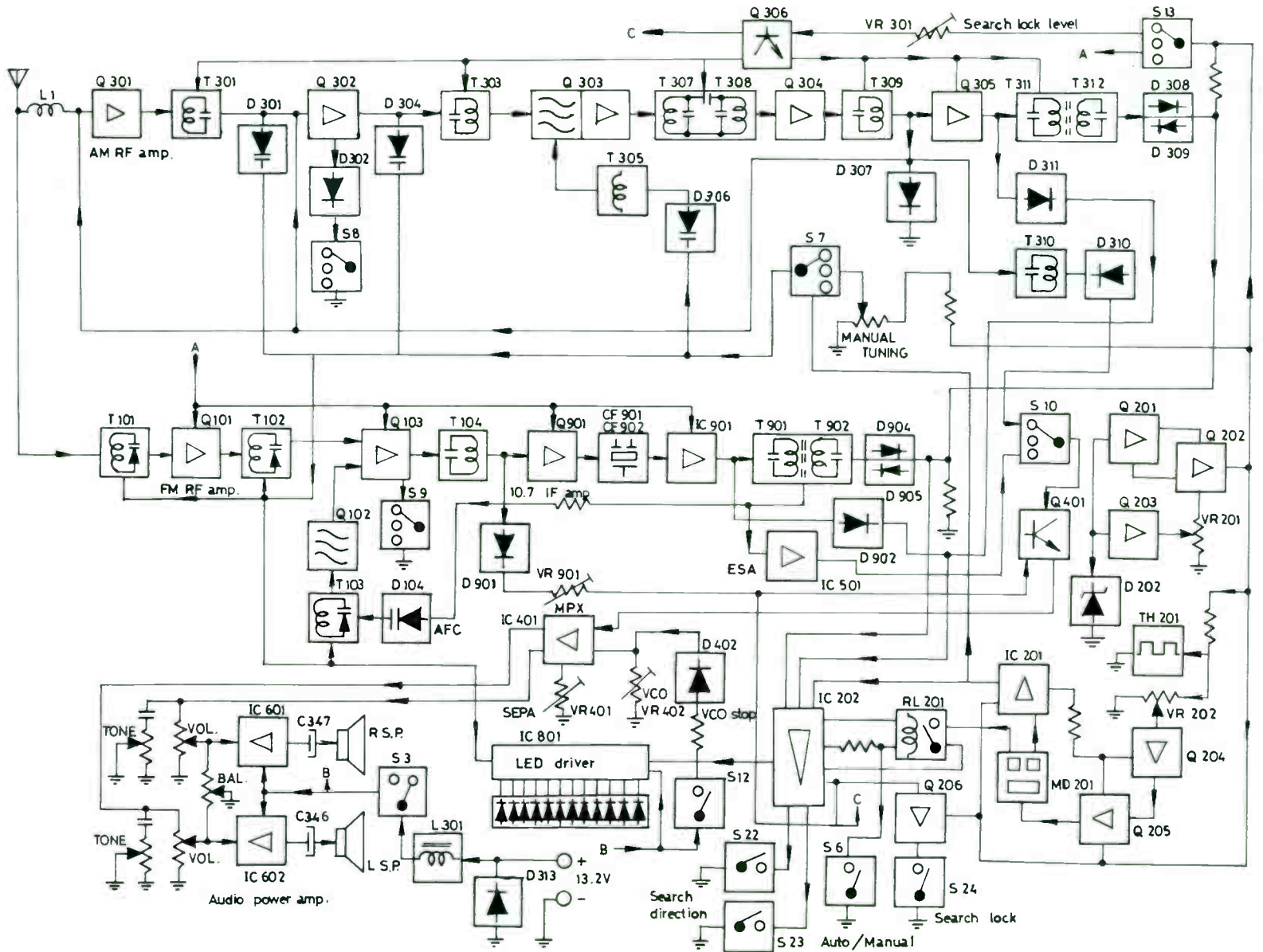


MAIN (MW/LW RF/IF) (KPB-GT13)



LED DIAL & INDICATOR COMPONENT (KPB-LS 25A)

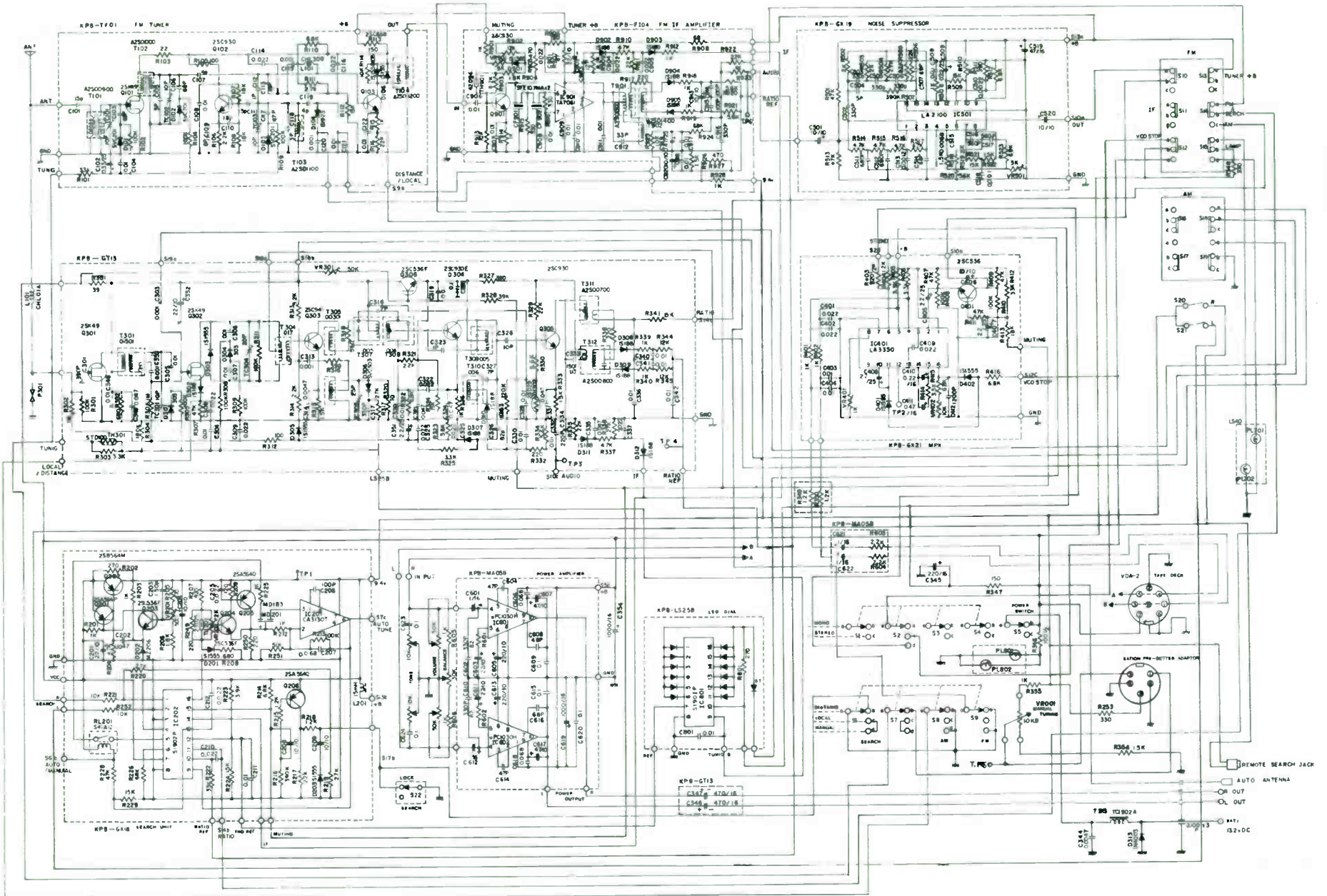




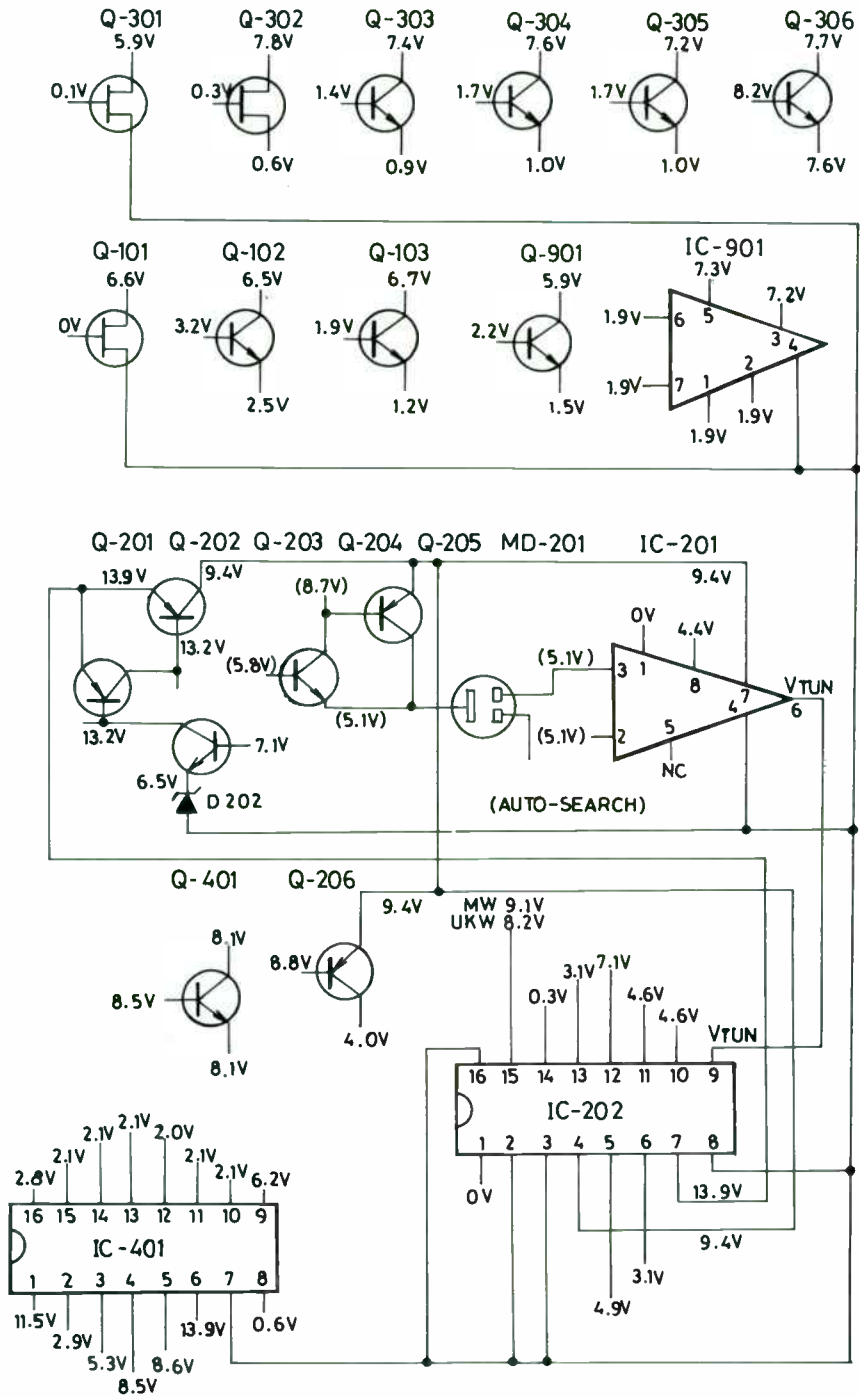
TROUBLE SHOOTING

RADIO SECTION

SYMPTOM		DEFECTIVE CIRCUIT	DEFECTIVE POINT AND CAUSE
NO SOUND	AM	Antenna input circuit	Antenna input defective. Poor antenna contact. Check wiring or co-axial cable open.
		Power supply circuit	Poor supply defective. Check wiring or function switch S5.
		Output circuit	Radio output circuit defective. Check wiring or function switch S10.
		RF & IF circuit	Check wiring or L101 open. Diode D301, 302, 303 or D310 defective. Check for emitter voltage of transistor Q301, 302, 303, 304, 305 or Q306. IF transformer T301, 304, 307, 308, 309 or 310 open.
	FM	Antenna input circuit	Antenna input defective. Check wiring or co-axial cable open.
		Power supply circuit	Poor supply defective. Check wiring or function switch S10.
		MPX & output circuit	Diode D401, D402 or transistor Q401 defective. Check for emitter voltage of transistor and each pin voltage of IC-401 or IC-501
		RF & IF circuit	RF transformer T101, T102 or T103 open IF transformer T104, T901 or T902 open. Diode D101, D102, D103, D104, D904 or D905 defective. Check for emitter voltage of transistor Q101, Q102, Q103, Q901 and each pin voltage of IC-901. Ceramic filter CF901 or CF902 defective.
INSUFFICIENT SOUND	AM	Antenna input circuit	Poor antenna contact. Antenna input defective. Check wiring or co-axial cable open.
		RF & IF or detector circuit	Deviation in IF transformer T307, 308, 309 or T310. Deviation in tracking alignment. Diode D307 deteriorated. Capacitor C301, 350, 305, 324, 331 or C349 defective.
	FM	RF & IF or detector circuit	Deviation in IF transformer T104 or T901 Deviation in tracking alignment. Antenna input defective. Diode D904 or D905 defective. Ceramic filter CF901 or CF902 defective. Transformer T101, T102, T104 or T901 defective. Capacitor C104, C108 or C907 defective.
DISTORTED SOUND	AM	AGC or detector circuit	Diode D303, 307 or D310 defective.
	FM	Detector circuit	Diode D904 or D905 defective. Deviation in transformer T902 or Diode D904, D905 defective.
OSCILLATION	AM	RF & IF circuit	Capacitor C351, 313, 322 or C352 defective. Diode D307 defective.
	FM	RF & IF circuit	Capacitor C108, C902, C908, C908, C910 or C911 defective.
POOR STEREO EFFECT		MPX circuit	VR401, VR402 mis-aligned. MPX IC IC-401 defective. MONO/ST switch S1 defective. Capacitor C412 defective.
STEREO INDICATOR LIGHT DEFECTIVE		Indicator circuit	Stereo indicator ST. LED defective. Resistor R404 defective. MPX IC IC-401 defective.
POOR AUTO-SEARCH TUNING		Search circuit	Memory diode MD201 defective. Deviation in IF transformer T311, 312 (AM) or T901, T902 (FM). Check wiring or function switch S6. Search IC IC201, IC202 defective.
POOR MANUAL TUNING		Search circuit	AUTO/MANUAL reed switch RL201 defective. Lock search switch S22 defective. Tuning resistor VR001 defective.

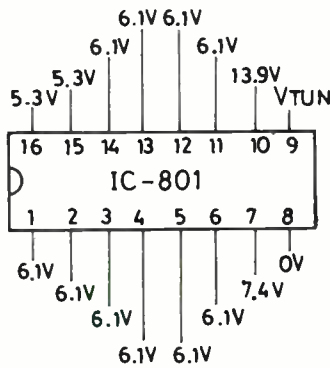
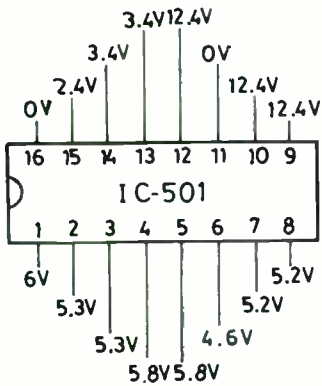
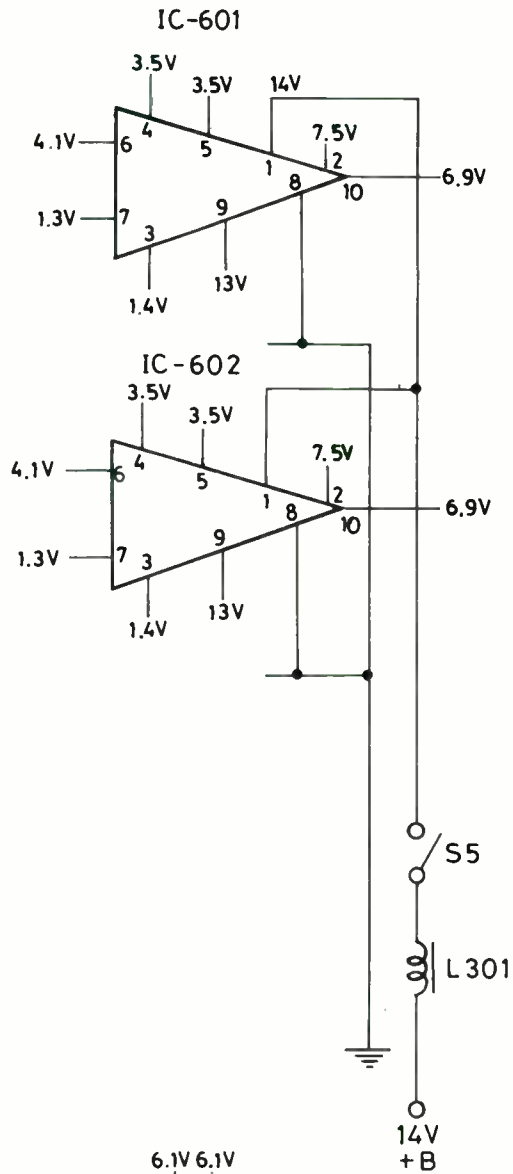


RADIO AND AUDIO VOLTAGE (1)



VOLTAGE READINGS TO COMMON GROUND(−) ARE MEASURED WITH DC V.T.V.M. UNDER NO SIGNAL.

RADIO AND AUDIO VOLTAGE (2)



AUTO-SEARCH CIRCUIT BOARD PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
IC201	09 000 312 008 0	D.C. amplifier IC CA3130T	R206	09 000 322 553 4	Carbon film resistor 1.8K ohm 1/4W
IC202	09 000 312 029 0	Tuning voltage controller S1902P	R220	09 000 322 573 4	Carbon film resistor 2.7K ohm 1/4W
Q201, 205, 206	09 000 303 002 1	Transistor 2SA564	R223	09 000 322 539 4	Carbon film resistor 3.9K ohm 1/4W
Q202	09 000 303 009 0	Transistor 2SB564	R204	09 000 322 603 4	Carbon film resistor 4.7K ohm 1/4W
Q203, 204	09 000 304 007 2	Transistor 2SC536	R214	09 000 322 623 4	Carbon film resistor 6.8K ohm 1/4W
D202	09 000 307 005 0	Zener diode MZ-206	R221, 252	09 000 322 643 4	Carbon film resistor 10K ohm 1/4W
D201, 203	09 000 305 005 0	Switching diode 1S1555	R224, 229	09 000 322 663 4	Carbon film resistor 15K ohm 1/4W
	09 202 452 002 0	Printed circuit board KPB-GX18	R217	09 000 322 683 4	Carbon film resistor 22K ohm 1/4W
RL201	09 202 384 001 0	Reed relay S41A12	R219	09 000 322 693 4	Carbon film resistor 27K ohm 1/4W
MD201	09 202 309 001 0	Memoriode MD1B3	R222	09 000 322 703 4	Carbon film resistor 33K ohm 1/4W
VR201	09 202 328 008 0	Trimmer 500 ohm (EVN-J0AA00B52)	R228	09 000 322 723 4	Carbon film resistor 47K ohm 1/4W
VR202	09 202 328 007 0	Trimmer 2K ohm (EVN-J0AA00B23)	R251	09 000 324 973 4	Metal film resistor 51K ohm 1/4W
L201	09 202 352 005 0	RF choke coil (15mH)	R226	09 000 322 743 4	Carbon film resistor 68K ohm 1/4W
TH201	09 000 308 054 0	Thermister 23D25	R213	09 000 322 763 4	Metal film resistor 100K ohm 1/4W
	09 208 413 001 0	Test point	R216	09 000 322 833 4	Carbon film resistor 390K ohm 1/4W
R209	09 000 322 403 4	Carbon film resistor 120 ohm 1/4W	C206	09 000 334 212 1	Ceramic capacitor 100pF 50V SL
R249, 250	09 000 322 433 4	Carbon film resistor 220 ohm 1/4W	C203	09 000 334 232 1	Ceramic capacitor 150pF 50V SL
R202	09 000 322 443 4	Carbon film resistor 270 ohm 1/4W	C211	09 000 333 472 3	Ceramic capacitor 0.01μF 50V ZF (Z)
R253	09 000 322 453 4	Carbon film resistor 330 ohm 1/4W	C205, 210, 212	09 000 333 502 3	Ceramic capacitor 0.022μF 50V ZF (Z)
R255	09 000 322 473 4	Carbon film resistor 470 ohm 1/4W	C202	09 000 335 522 2	Mylar capacitor 0.047μF
R208	09 000 322 493 4	Carbon film resistor 680 ohm 1/4W	C207	09 000 335 532 2	Mylar capacitor 0.068μF
R207	09 000 322 503 4	Carbon film resistor 820 ohm 1/4W	C204, 208	09 000 332 122 2	Electrolytic capacitor 10μF / 10WV
R201, 203, 225	09 000 322 513 4	Carbon film resistor 1K ohm 1/4W	C209	09 000 332 122 4	Electrolytic capacitor 10μF / 10WV (NP)
R212	09 000 324 513 4	Metal film resistor 1K ohm 1/4W	C201	09 000 332 133 2	Electrolytic capacitor 22μF / 10WV
R215, 218	09 000 322 523 4	Carbon film resistor 1.2K ohm 1/4W			

MPX CIRCUIT BOARD PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
	09 202 452 007 0	Printed circuit board (KPB-GX21)	R415, 416	09 000 322 623 4	Carbon film resistor 6.8K ohm 1/4W
IC401	09 000 312 058 0	Monolithic IC LA3350	R413	09 000 322 673 4	Carbon film resistor 18K ohm 1/4W
Q401	09 000 304 007 2	NPN transistor 2SC-536F	R412	09 000 322 703 4	Carbon film resistor 33K ohm 1/4W
D401, 402	09 000 305 005 0	Switching diode 1S1555	R407, 409, 411	09 000 322 723 4	Carbon film resistor 47K ohm 1/4W
VR401	09 202 328 005 0	Trimmer 1K (EVN-J0AA00B13)	R410	09 000 322 763 4	Carbon film resistor 100K ohm 1/4W
VR402	09 202 328 006 0	Trimmer 10K (EVN-J0AA00B14)	C412	09 000 336 352 2	Polystyrene capacitor 1200pF (J) 50V
	09 208 413 001 0	Test point	C403, 404	09 000 335 472 2	Mylar capacitor 0.01μF 50V
	09 202 682 010 0	P.C.B. holder (Y)	C401, 402, 409	09 000 335 502 2	Mylar capacitor 0.022μF 50V
R403	09 000 322 504 4	Carbon film resistor 820 ohm 1/2W	C410	09 000 337 033 2	Tantalum capacitor 0.22μF 16V
R401, 402	09 000 322 513 4	Carbon film resistor 1K ohm 1/4W	C411	09 000 337 053 2	Tantalum capacitor 0.47μF 16V
R404	09 000 322 523 4	Carbon film resistor 1.2K ohm 1/4W	C405, 407, 408	09 000 332 084 2	Electrolytic capacitor 2.2μF 25V
R405, 406, 414	09 000 322 583 4	Carbon film resistor 3.3K ohm 1/4W	C406	09 000 332 122 2	Electrolytic capacitor 10μF 10V

FM IF CIRCUIT BOARD PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
	09 202 452 005 0	Printed circuit board (KPB-F104)	R926	09 000 322 533 4	Carbon film resistor 1.5K ohm 1/4W
	09 202 682 005 0	Shield plate (B)	R904	09 000 322 553 4	Carbon film resistor 1.8K ohm 1/4W
	09 202 682 008 0	Shield case (M)	R910	09 000 322 603 4	Carbon film resistor 4.7K ohm 1/4W
IC901	09 000 312 033 0	Monolithic IC TA7061AP	R920, 921	09 000 322 613 4	Carbon film resistor 5.6K ohm 1/4W
Q901	09 000 304 014 1	NPN transistor 2SC930E	R903, 909	09 000 322 633 4	Carbon film resistor 8.2K ohm 1/4W
D901	09 000 305 005 0	Switching diode 1S1555	R913, 925	09 000 322 643 4	Carbon film resistor 10K ohm 1/4W
D902, 903, 904	09 000 305 003 0	Switching diode 1S188FM	R902	09 000 322 653 4	Carbon film resistor 12K ohm 1/4W
905			R911, 922	09 000 322 683 4	Carbon film resistor 22K ohm 1/4W
TH901	09 000 308 053 0	Thermister 42D26	R924	09 000 322 743 4	Carbon film resistor 68K ohm 1/4W
CF901, 902	09 202 364 001 0	Ceramic filter 10.7MHz (SFE10.7MA5Z)	C903	09 000 334 092 1	Ceramic capacitor 12pF 50V SL
VR901	09 202 328 004 0	Trimmer 5K (EVN-J0AA00B53)	C912	09 000 334 152 4	Ceramic capacitor 33pF 50V RH
T901	09 202 353 004 0	FM-DET coil (A2S01300)	C914, 915	09 000 333 212 1	Ceramic capacitor 100pF 50V YP
T902	09 202 353 005 0	FM-DET coil (A2S01400)	C916	09 000 333 282 1	Ceramic capacitor 330pF 50V YP
R907	09 000 322 353 4	Carbon film resistor 47 ohm 1/4W	C906, 907, 908	09 000 333 482 3	Ceramic capacitor 0.01μF 50V ZF
R908	09 000 322 373 4	Carbon film resistor 68 ohm 1/4W	909, 910, 911		
R906	09 000 322 413 4	Carbon film resistor 150 ohm 1/4W	917, 918		
R917	09 000 322 433 4	Carbon film resistor 220 ohm 1/4W	C901, 904, 905	09 000 333 502 3	Ceramic capacitor 0.022μF 50V ZF
R915, 916	09 000 322 453 4	Carbon film resistor 330 ohm 1/4W	C919	09 000 337 053 2	Tantalum capacitor 0.47μF 25V
R905, 927	09 000 322 473 4	Carbon film resistor 470 ohm 1/4W	C913, 920	09 000 332 122 2	Electrolytic capacitor 10μF 10WV
R901, 912, 914	09 000 322 513 4	Carbon film resistor 1K ohm 1/4W	C902	09 000 332 132 2	Electrolytic capacitor 22μF 10WV
918, 919, 923					

ESU (FM INTERFERENCE SUPPRESSION) CIRCUIT BOARD PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
	09 202 452 009 0	Printed circuit board (KPB-GX19)	R505	09 000 322 753 4	Carbon film resistor 82K ohm 1/4W
IC501	09 000 312 016 0	Monolithic IC LA2100	R507	09 000 322 833 4	Carbon film resistor 390K ohm 1/4W
VR501	09 202 328 004 0	Trimmer 5K (EVN-J0AA00B53)	C504	09 000 334 062 1	Ceramic capacitor 5pF 50V SL
	09 202 682 010 0	PCB holder (Y)	C507, 514	09 000 334 192 1	Ceramic capacitor 68pF 50V SL
R511	09 000 322 463 4	Carbon film resistor 390 ohm 1/4W	C502, 503, 505	09 000 333 282 1	Ceramic capacitor 330pF 50V YB (B)
R508, 510	09 000 322 513 4	Carbon film resistor 1K ohm 1/4W	506		
R518	09 000 322 533 4	Carbon film resistor 1.5K ohm 1/4W	C516, 517	09 000 333 312 1	Ceramic capacitor 560pF 50V YB (B)
R502, 503, 519	09 000 322 983 4	Carbon film resistor 2K ohm 1/4W	C511, 512	09 000 333 322 1	Ceramic capacitor 680pF 50V YB (B)
R504	09 000 322 573 4	Carbon film resistor 2.7K ohm 1/4W	C518	09 000 333 342 1	Ceramic capacitor 0.001μF 50V YB (B)
R514, 515, 516	09 000 322 603 4	Carbon film resistor 4.7K ohm 1/4W	C513	09 000 333 352 1	Ceramic capacitor 0.0012μF 50V YB (B)
517			C510	09 000 333 382 1	Ceramic capacitor 0.0022μF 50V YB (B)
R520	09 000 322 613 4	Carbon film resistor 5.6K ohm 1/4W	C508	09 000 333 472 3	Ceramic capacitor 0.01μF 50V ZF
R512, 523	09 000 322 623 4	Carbon film resistor 6.8K ohm 1/4W	C509	09 000 337 033 2	Tantalum capacitor 0.22μF 25V
R509, 521, 522	09 000 322 663 4	Carbon film resistor 15K ohm 1/4W	C501, 520	09 000 332 122 2	Electrolytic capacitor 10μF 10V
R506	09 000 322 683 4	Carbon film resistor 22K ohm 1/4W	C519	09 000 332 153 2	Electrolytic capacitor 47μF 16V
R501, 513	09 000 322 723 4	Carbon film resistor 47K ohm 1/4W			

FM FRONT END CIRCUIT BOARD PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
	09 202 452 004 0	Printed circuit board (KPB-TF01)	R110	09 000 322 623 4	Carbon film resistor 6.8K ohm 1/4W
	09 202 682 004 0	Shield plate (A)	R114	09 000 322 643 4	Carbon film resistor 10K ohm 1/4W
	09 202 682 006 0	Shield case (L)	R112	09 000 322 663 4	Carbon film resistor 15K ohm 1/4W
Q101	09 000 302 003 0	FET transistor 2SK49	R107, 108	09 000 322 673 4	Carbon film resistor 18K ohm 1/4W
Q102	09 000 304 014 1	NPN transistor 2SC930E	R116	09 000 322 683 4	Carbon film resistor 22K ohm 1/4W
Q103	09 000 304 008 2	NPN transistor 2SC668E	R101	09 000 322 703 4	Carbon film resistor 33K ohm 1/4W
D101, 102, 103	09 000 306 004 0	Variable capacitance diode SVC201	R102, 104, 109	09 000 322 763 4	Carbon film resistor 100K ohm 1/4W
D104	09 000 306 003 0	Variable capacitance diode 1S-1923 (1S-2236)	C112	09 000 334 022 3	Ceramic capacitor 1pF 50V CH
D105, 106	09 000 305 005 0	Switching diode 1S1555	C118	09 000 334 042 3	Ceramic capacitor 3pF 50V CH
T101	09 202 353 001 0	FM-ANT coil (A2500900)	C107, 119	09 000 334 052 3	Ceramic capacitor 4pF 50V CH
T102	09 202 353 002 0	FM-RF coil (A2501000)	C111	09 000 334 062 3	Ceramic capacitor 5pF 50V CH
T103	09 202 353 003 0	FM-OSC coil (A2501100)	C105	09 000 334 062 1	Ceramic capacitor 5pF 50V SL
T104	09 202 353 020 0	FM-IFT-1 (A2501200)	C109	09 000 334 352 3	Ceramic capacitor 8pF 50V CH
L101	09 202 352 001 0	FM filter choke (CHL30B)	C101, 113	09 000 334 102 1	Ceramic capacitor 15pF 50V SL
TC101	09 202 344 002 0	Trimmer cap. 10p (ECV-1ZW10X53D)	C110	09 000 334 112 3	Ceramic capacitor 18pF 50V CH
TC102, 103	09 202 344 002 0	Trimmer cap. 10p (ECV-1ZW10X53D)	C117	09 000 334 172 4	Ceramic capacitor 47pF 50V RH
	09 202 482 001 0	Ferrite beads core (EI-ARH02401005)	C103, 106	09 000 334 192 1	Ceramic capacitor 68pF 50V SL
R103	09 000 322 313 4	Carbon film resistor 22 ohm 1/4W	C115, 120	09 000 333 342 1	Ceramic capacitor 0.001μF 50V YB (B)
R105	09 000 322 393 4	Carbon film resistor 100 ohm 1/4W	C104, 108, 121	09 000 333 472 3	Ceramic capacitor 0.01μF 50V ZF
R113	09 000 322 413 4	Carbon film resistor 150 ohm 1/4W	122		
R115	09 000 322 513 4	Carbon film resistor 1K ohm 1/4W	C114, 116	09 000 333 502 3	Ceramic capacitor 0.022μF 50V ZF
R106	09 000 322 563 4	Carbon film resistor 2.2K ohm 1/4W	C102	09 000 337 043 2	Tantalum capacitor 0.33μF 25V
R111	09 000 322 573 4	Carbon film resistor 2.7K ohm 1/4W			

MAIN AMPLIFIER CIRCUIT BOARD PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
	09 202 452 006 0	Printed circuit board (KPB-MA05B)	C606, 618	09 000 335 532 2	Mylar capacitor 0.068μF
	09 202 682 009 0	Heat sink (#12)	C609, 615, 620	09 000 333 555 3	Ceramic capacitor 0.1μF 12V
IC601, 602	09 000 312 055 0	Monolithic IC μPC1030H	623, 624		
R601, 602	09 000 322 383 4	Carbon film resistor 82 ohm 1/4W	C601, 612, 621	09 000 332 073 2	Electrolytic capacitor 1μF 16V
R603, 604	09 000 322 563 4	Carbon film resistor 2.2K ohm 1/4W	622		
R605, 606	09 000 322 513 4	Carbon film resistor 1K ohm 1/4W	C603, 611	09 000 332 132 2	Electrolytic capacitor 22μF 10V
C604, 614	09 000 334 172 1	Ceramic capacitor 47pF 50V SL	C607, 617	09 000 332 152 2	Electrolytic capacitor 47μF 10V
C608, 616	09 000 334 192 3	Ceramic capacitor 68pF 50V CH	C605, 613	09 000 332 172 2	Electrolytic capacitor 220μF 10V
C602, 610	09 000 333 282 1	Ceramic capacitor 330pF 50V B	C619	09 000 332 203 2	Electrolytic capacitor 1000μF 16V

DIAL LED'S CIRCUIT BOARD PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
IC801	09 202 452 010 0	Printed circuit board (KPB-LS25A)	R801	09 000 333 443 4	Carbon film resistor 270 ohm 1/4W
PL801, 802	09 000 312 028 0	Monolithic IC S1901P	C801	09 000 333 473 3	Ceramic capacitor 0.01μF 50V ZF
	09 202 422 001 0	Lamp (T-3, 6V/30mA)			

MAIN CIRCUIT BOARD PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
	09 202 451 003 0	Printed circuit board (KPB-GT13)	R307	09 000 322 723 4	Carbon film resistor 47K ohm 1/4W
Q301, 302	09 000 302 003 0	FET transistor 2SK49	R301	09 000 322 763 4	Carbon film resistor 100K ohm 1/4W
Q303	09 000 304 015 2	NPN transistor 2SC941Y	R305	09 000 322 763 4	Carbon film resistor 100K ohm 1/4W
Q304, 305	09 000 304 014 1	NPN transistor 2SC930E	R308	09 000 322 763 4	Carbon film resistor 100K ohm 1/4W
Q306	09 000 304 007 2	NPN transistor 2SC536F	R309	09 000 322 763 4	Carbon film resistor 100K ohm 1/4W
D301	09 000 306 005 0	Variable capacitance diode SVC303C	R311	09 000 322 763 4	Carbon film resistor 100K ohm 1/4W
D304	09 000 306 005 0	Variable capacitance diode SVC303C	R353	09 000 322 773 4	Carbon film resistor 120K ohm 1/4W
D306	09 000 306 005 0	Variable capacitance diode SVC303C	R304	09 000 322 793 4	Carbon film resistor 180K ohm 1/4W
D302, 307	09 000 305 003 0	Diode 1S188FM	R302	09 000 322 893 4	Carbon film resistor 1M ohm 1/4W
D310, 311	09 000 305 003 0	Diode 1S188FM	R306	09 000 322 893 4	Carbon film resistor 1M ohm 1/4W
D308, 309	09 000 305 003 0	Diode 1S188FM	C323	09 000 334 022 1	Ceramic capacitor 1pF 50V SL
D312	09 000 305 003 0	Diode 1S188FM	C316	09 000 334 072 1	Ceramic capacitor 7pF 50V SL
D303	09 000 305 005 0	Diode 1S1555	C327	09 000 334 072 1	Ceramic capacitor 7pF 50V SL
D305	09 000 305 005 0	Diode 1S1555	C328	09 000 334 082 1	Ceramic capacitor 10pF 50V SL
D313	09 000 305 002 0	Diode 1N4003	C326	09 000 334 202 1	Ceramic capacitor 82pF 50V SL
T301	09 202 353 006 0	AM ANT coil (A2S01501)	C333	09 000 334 232 7	Ceramic capacitor 150pF 50V UJ
T304	09 202 353 009 0	LW RE coil (A2S001700)	C334	09 000 333 262 1	Ceramic capacitor 220pF 50V YP
T307	09 202 353 012 0	AM IFT (A2S00500)	C317	09 000 333 282 1	Ceramic capacitor 330pF 50 B
T309	09 202 353 012 0	AM IFT (A2S00500)	C301	09 000 333 292 1	Ceramic capacitor 390pF 50V YP
T310	09 202 353 015 0	AM DET (A2S00600)	C303	09 000 333 342 1	Ceramic capacitor 0.001µF 50V YP
T312	09 202 353 014 0	AM Ratio-DET (A2S00800)	C313	09 000 333 342 1	Ceramic capacitor 0.001µF 50V YP
T311	09 202 353 016 0	AM Ratio-DET (A2S00700)	C314	09 000 333 432 1	Ceramic capacitor 0.0047µF 50V YP
L301	09 202 356 001 0	Choke transformer	C344	09 000 333 432 1	Ceramic capacitor 0.0047µF 50V YP
TH301	09 000 308 051 0	Thermister STD100	C305	09 000 333 473 1	Ceramic capacitor 0.01µF 50V YP
TH302	09 000 308 052 0	Thermister 2SD29	C306	09 000 333 473 1	Ceramic capacitor 0.01µF 50V YP
TC301	09 202 344 002 0	Trimmer cap. 10P (ECV-1ZW10X53D)	C307	09 000 333 473 1	Ceramic capacitor 0.01µF 50V YP
TC304	09 202 344 001 0	Trimmer cap. 20P (ECV-1ZW20X53D)	C304	09 000 333 473 3	Ceramic capacitor 0.01µF 50V F
TC305	09 202 344 003 0	Trimmer cap. 25P (ECV-1ZW25X53D)	C319	09 000 333 473 3	Ceramic capacitor 0.01µF 50V F
VR301	09 202 328 009 0	Trimmer 50K (EVN-10AA00B54)	C320	09 000 333 473 3	Ceramic capacitor 0.01µF 50V F
R351	09 000 322 343 4	Carbon film resistor 39ohm 1/4W	C330	09 000 333 473 3	Ceramic capacitor 0.01µF 50V F
R320	09 000 322 274 4	Carbon film resistor 10 ohm 1/4W	C332	09 000 333 473 3	Ceramic capacitor 0.01µF 50V F
R346	09 000 322 394 4	Carbon film resistor 100 ohm 1/2W	C340	09 000 333 473 3	Ceramic capacitor 0.01µF 50V F
R312	09 000 322 393 4	Carbon film resistor 100 ohm 1/4W	C341	09 000 333 473 3	Ceramic capacitor 0.01µF 50V F
R347	09 000 322 413 4	Carbon film resistor 150 ohm 1/4W	C336	09 000 333 473 3	Ceramic capacitor 0.01µF 50V F
R332	09 000 322 433 4	Carbon film resistor 220 ohm 1/4W	C342	09 000 333 473 3	Ceramic capacitor 0.01µF 50V F
R336	09 000 322 433 4	Carbon film resistor 220 ohm 1/4W	C348	09 000 333 473 3	Ceramic capacitor 0.01µF 50V F
R348	09 000 322 453 4	Carbon film resistor 330 ohm 1/4W	C308	09 000 333 503 3	Ceramic capacitor 0.022µF 50V F
R316	09 000 322 463 4	Carbon film resistor 390 ohm 1/4W	C309	09 000 333 503 3	Ceramic capacitor 0.022µF 50V F
R327	09 000 322 463 4	Carbon film resistor 390 ohm 1/4W	C325	09 000 333 503 3	Ceramic capacitor 0.022µF 50V F
R318	09 000 322 483 4	Carbon film resistor 560 ohm 1/4W	C337	09 000 333 503 3	Ceramic capacitor 0.022µF 50V F
R352	09 000 322 493 4	Carbon film resistor 680 ohm 1/4W	C335	09 000 333 523 3	Ceramic capacitor 0.047µF 50V F
R326	09 000 322 513 4	Carbon film resistor 1K ohm 1/4W	C349	09 000 333 523 3	Ceramic capacitor 0.047µF 50V F
R339	09 000 322 513 4	Carbon film resistor 1K ohm 1/4W	C329	09 000 335 472 2	Mylar capacitor 0.01µF 50V
R340	09 000 322 513 4	Carbon film resistor 1K ohm 1/4W	C322	09 000 335 502 2	Mylar capacitor 0.022µF 50V
R355	09 000 322 513 4	Carbon film resistor 1K ohm 1/4W	C331	09 000 335 522 2	Mylar capacitor 0.047µF 50V
R349	09 000 322 523 4	Carbon film resistor 1.2K ohm 1/4W	C335	09 000 335 522 2	Mylar capacitor 0.047µF 50V
R350	09 000 322 523 4	Carbon film resistor 1.2K ohm 1/4W	C353	09 000 335 552 2	Mylar capacitor 0.1µF 50V
R315	09 000 322 533 4	Carbon film resistor 1.5K ohm 1/4W	C351	09 000 332 084 2	Electrolytic capacitor 2.2µF 25V
R333	09 000 322 533 4	Carbon film resistor 1.5K ohm 1/4W	C352	09 000 332 132 2	Electrolytic capacitor 22µF 10V
R354	09 000 322 533 4	Carbon film resistor 1.5K ohm 1/4W	C345	09 000 332 173 2	Electrolytic capacitor 220µF 16V
R314	09 000 322 563 4	Carbon film resistor 2.2K ohm 1/4W	C346	09 000 332 193 2	Electrolytic capacitor 470µF 16V
R325	09 000 322 583 4	Carbon film resistor 3.3K ohm 1/4W	C347	09 000 332 193 2	Electrolytic capacitor 470µF 16V
R303	09 000 322 583 4	Carbon film resistor 3.3K ohm 1/4W	C357	09 000 322 203 2	Electrolytic capacitor 1000µF 16V
R337	09 000 322 603 4	Carbon film resistor 4.7K ohm 1/4W			
R323	09 000 322 613 4	Carbon film resistor 5.6K ohm 1/4W			
R334	09 000 322 613 4	Carbon film resistor 5.6K ohm 1/4W			
R330	09 000 322 613 4	Carbon film resistor 5.6K ohm 1/4W			
R322	09 000 322 623 4	Carbon film resistor 6.8K ohm 1/4W			
R313	09 000 322 633 4	Carbon film resistor 8.2K ohm 1/4W			
R344	09 000 322 653 4	Carbon film resistor 12K ohm 1/4W			
R345	09 000 322 653 4	Carbon film resistor 12K ohm 1/4W			
R324	09 000 322 663 4	Carbon film resistor 15K ohm 1/4W			
R341	09 000 322 663 4	Carbon film resistor 15K ohm 1/4W			
R321	09 000 322 683 4	Carbon film resistor 22K ohm 1/4W			
R329	09 000 322 683 4	Carbon film resistor 22K ohm 1/4W			
R335	09 000 322 683 4	Carbon film resistor 22K ohm 1/4W			
R317	09 000 322 693 4	Carbon film resistor 27K ohm 1/4W			
R338	09 000 322 693 4	Carbon film resistor 27K ohm 1/4W			
R328	09 000 322 713 4	Carbon film resistor 39K ohm 1/4W			

PARTS LIST

Ref. No.	Part No.	Description	Q'ty	Ref. No.	Part No.	Description	Q'ty
1	09 202 451 002 0	Ass'd circuit board (KPB-GX18) search	1	63	09 202 683 004 0	Insulation fiber (#06)	1
2	09 202 451 003 0	Ass'd circuit board (KPB-GT13) main P.C.B.	1	64	09 202 682 018 0	Cabinet cover (#666A)	2
3	09 202 682 004 0	Shield plate (A)	1	65	09 202 681 001 0	Shield plate (X) ass'y	1
4	09 202 682 006 0	Shield case (L)	1	66	09 202 653 002 0	Front installation bracket	2
5	09 202 451 004 0	Ass'd circuit board (KPB-TF01) FM tuner	1	67	09 202 726 001 0	Front installation spring	4
6	09 202 682 005 0	Shield plate (B)	1	68			
7	09 202 682 007 0	Shield case (K)	1	69	09 202 402 006 0	2P DIN socket ass'y (L)	1
8	09 202 682 008 0	Shield case (M)	1	70	09 202 402 007 0	2P DIN socket ass'y (R)	1
9				71	09 000 553 504 1	Bind head screw M2.6 x 4 (unichromate)	2
10	09 202 682 009 0	Heat sink (#12)	1	72	09 000 553 506 1	Bind head screw M2.6 x 6 (unichromate)	2
11	09 202 451 006 0	Ass'd circuit board (KPB-MA05B) main amp.	1	73	09 000 522 704 5	Pan head screw M3 x 4 (bronze)	4
12	09 202 682 010 0	P.C.B. holder (Y)	3	74	09 000 553 704 1	Bind head screw M3 x 4 (unichromate)	2
13	09 202 451 007 0	Ass'd circuit board (KPB-GX21) MPX	1	75	09 000 553 706 1	Bind head screw M3 x 6 (unichromate)	1
14	09 208 407 007 0	Power source connector	1	76	09 000 573 422 1	Tapping bind head screw M3 x 5 (unichromate)	4
15	09 202 451 009 0	Ass'd circuit board (KPB-GX19) ESU	1	77	09 000 573 432 1	Tapping bind head screw M3 x 6 (unichromate)	2
16	09 202 682 011 0	Cabinet side (#666A)	1	78	09 000 573 433 1	Tapping bind head screw M3 x 6 (unichromate)	9
17	09 202 682 019 0	VR adjust washer (RC-6)	2		09 208 407 008 0	Grounding wire	1
18	09 202 328 003 0	Potention meter (R)(KVR-303301001)	1		09 202 682 020 0	Rear suspension bracket (A)	1
19	09 202 328 017 0	Potention meter (L)(KVR-303404002)	1		09 202 682 021 0	Rear suspension bracket (B)	1
20	09 202 583 001 0	VR nut	8		09 202 682 022 0	Perforated strap	1
21	09 202 592 001 0	VR washer	4		09 202 714 002 0	Rear suspension plug	1
22	09 202 375 002 0	Push switch (S-lock) (PS-149)	1		09 203 736 102 0	FCC label	1
23	09 202 682 012 0	Cabinet rear (#666A)	1		09 208 736 301 0	Warranty label	1
24	09 202 682 013 0	Antenna cable clamp (G)	1		09 202 736 401 0	Patent label	1
25	09 202 682 014 0	Antenna shield case (I)	1		09 202 736 403 0	VDA-2 label	1
26	09 202 682 015 0	Filter holder (L)	1		09 202 736 404 0	Presetter label	1
27	09 202 682 003 0	Line cable clamp (R)	1		09 202-736 405 0	Auto-ant tag	1
28	09 202 682 016 0	Cable clamp (#1)	1		09 203 736 501 0	Carton warranty #label	2
29	09 202 451 012 0	Ass'd circuit board (KPB-RF13) ant choke	1		09 202 782 002 0	Screw kit	1
30	09 202 346 001 0	Feed through capacitor (PL-20)	4		09 203 902 017 0	Operating inst. manual	1
31	09 202 402 002 0	5P DIN socket ass'y (Preset)	1		09 203 922 008 0	Gift box	1
32	09 202 402 005 0	8P DIN socket ass'y (Tape deck)	1		09 202 923 002 0	Polyethylene bag (115X200)	1
33	09 203 403 001 0	Remote search jack	1		09 202 923 003 0	Polyethylene bag (300X400)	1
34					09 202 924 001 0	Silica gel	1
35	09 202 407 001 0	Auto antenna connector	1		09 202 925 001 0	Plastic foam cushion	2
36	09 202 406 001 0	Antenna receptacle (JL-7)	1				
37	09 202 652 006 0	Nose piece (#666A)	1				
38	09 202 656 001 1	Dial scale (#666A)	1				
39	09 202 682 017 0	Dial back plate (#666A)	1				
40	09 202 732 004 1	Nose piece plate	1				
41	09 202 652 007 0	Indicator lens (#707 Red)	2				
42	09 202 652 008 0	Trim plate (J-277)	1				
43	09 202 732 016 0	Trim plate inlay (L)	1				
44	09 202 732 017 0	Trim plate inlay (R)	1				
45	09 202 732 007 0	Trim plate brand inlay	1				
46	09 202 683 002 0	Dial felt	1				
47	09 202 714 001 0	Lamp bushing (#09)	1				
48	09 202 451 010 0	Ass'd circuit board (KPB-LS25A) L.E.D.	1				
49	09 202 415 002 0	P.C.B. connector female)	1				
50	09 202 415 001 0	P.C.B. connector (male) (5048-06A)	1				
51	09 202 451 011 0	Ass'd circuit board (KPB-LS40) lamps	1				
52	09 202 422 001 0	Lamp (T-3, 6V/30mA)	4				
53	09 202 652 009 0	Front knob (#128)	2				
54	09 202 652 010 0	Middle knob (#129)	2				
55	09 202 652 011 0	Back up knob (#130)	2				
56	09 202 375 003 0	4-gang push switch (SUB54-24062A)	1				
57	09 202 652 012 0	Push button (Type 30A)	2				
58	09 202 652 023 0	Push button (Type 32F)	1				
59							
60	09 202 652 024 0	Push button (Type 32A)	1				
61	09 202 652 016 0	Push button (Type 31)	1				
62	09 202 683 003 0	Push button screen	1				

ALIGNMENT INSTRUCTIONS

Check for specified source voltage
 Connect low sides of generator and indicator to ground unless specified otherwise.
 Use only enough generator output to provide a usable indication.
 Suggested Alignment Tools: GC ELECTRONICS:
 All Coils and Trimmers 5000, 8276, 9089

PUSH-BUTTON ADJUSTMENT

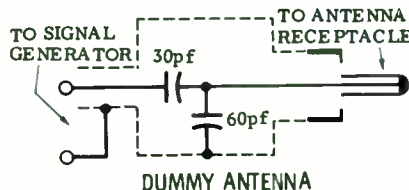
1. Pull button out.
2. Tune manually to desired station.
3. Press button in firmly.
4. Repeat for remaining buttons.

AM ALIGNMENT—SELECTOR IN AM POSITION

Connect output meter across speaker voice coil.

GENERATOR COUPLING	GENERATOR FREQUENCY	RADIO DIAL SETTING	ADJUST	REMARKS
High side thru .1uF to antenna input	455kHz 400-Hz mod.	High freq end stop	T3, T2	Adjust for maximum.
Thru dummy antenna to antenna input.	1615kHz 400-Hz mod.	1615kHz	TC6, TCS	Adjust for maximum.
Thru dummy antenna to antenna input.	1400kHz 400-Hz mod.	1400kHz	TC4	Adjust for maximum.

With radio installed in car and antenna extended 30", tune in a weak station near 1400kHz and adjust TC4 for maximum output. Antenna adjustment is located inside tape compartment at right rear.



FM STEREO ALIGNMENT

The following steps must be performed before starting to align the FM Stereo Decoder system.

1. The "AM-FM" switch must be in the "FM" position.
2. Connect resistive loads to left-rear & right-rear speaker outputs.
3. Tone control, full treble position.
4. Fader control, rotated to rear speakers (counterclockwise) position.
5. Balance control, to give equal power output.
6. The generator output must be at a high RF level (1KV or better).

7. FM radio "RF-IF" circuits must be properly aligned before beginning stereo alignment. CAUTION should be observed when servicing the multiplex IC. Shorting or grounding of contact pins will cause damage to the IC.
8. For good stereo reception it is imperative that the Stereo Freq Adjust Control be accurately tuned for 19kHz output on pin no. 10 of IC201 (typically within 1%). Two adjustment procedures are given depending upon equipment availability, see figures C and D.

STEP	GENERATOR COUPLING	GENERATOR FREQUENCY	OUTPUT INDICATOR	ADJUST	REMARKS
1	Connect an RF modulated signal to antenna input	*98MHz (20.25kHz peak dev, 400Hz mod + 19kHz, 10% pilot) into limiting 1KV	VTVM-AC probe or scope across 4.0 ohm output load	--	Accurately tune radio to RF frequency of stereo generator (max audio output).
2	"	*98MHz (19kHz pilot w/6.75kHz, 10% deviation)	--	VR201	1. Adjust VR201 until stereo light comes on. 2. Reduce signal and adjust VR201 for steady light.
3	No sig. input	--	Connect test equipment as shown in figure C or D	VR201	VR201 Final Alignment—Carefully adjust VR201 for 19kHz as observed on counter or scope, see figures 7 and 8. (A minimal adjustment should be made.)

* Typical only; select a frequency to avoid station interference.

ALIGNMENT INSTRUCTIONS (Continued)

FM ALIGNMENT

GENERAL INFORMATION - The factory alignment is performed with laboratory equipment. The circuits are quite stable and not ordinarily subject to drift, therefore, before alignment is attempted, the set should be thoroughly checked for circuit troubles. An FM generator should be used for FM alignment.

ALIGNMENT CONDITIONS - Input level to the receiver +14.0V DC. During FM alignment, the generator output signal amplitude must be set above or below the receiver limiting level depending on the adjustment made. The limiting level is the point where further increase in input does not increase the output level. During alignment then, either keep the level below this point (below limiting level) or above this point (into limiting) as pointed out in the alignment procedure. In addition, the signal generator leads must be short and carefully shielded. If noise voltage on the generator leads is high enough to cause limiting, it is almost impossible to align the receiver properly because tuning adjustments will not show up as variations in the VTVM reading.

PRE-ALIGNMENT STEPS

1. The "AM-FM" switch, in "FM" position.
2. Tone control, in full treble position (C.W.).
3. Balance control, equal power output.
4. Connect resistive loads to left & right speaker output.

FM ALIGNMENT USING FM GENERATOR

STEP	GENERATOR COUPLING	GENERATOR FREQUENCY	RADIO FREQUENCY	OUTPUT INDICATOR	ADJUST	REMARKS
FM IF ALIGNMENT						
1	To ant recept thru .1MF capacitor (Fig. A)	10.7MHz (75KHz deviation @ 400Hz Mod-into limiting.)	109 Mhz	VTVM-AC probe or scope across 4.0 ohm output load	T101	Adjust for max output.
2	"	100KuV or better 10.7MHz (75KHz deviation @ 400Hz Mod-below limiting)	"	"	T1	Adjust for max output. Repeat steps 1 & 2 for optimum peak.

The following steps are required to bring the IF system into line with the ceramic filters in order to achieve maximum sensitivity.

3	"	98MHz (75KHz deviation @ 400Hz Mod-Below limiting)	98MHz	"	Radio freq.	Adjust for best Symmetry on scope, or max output on VTVM.
4	"	98MHz (75KHz deviation @ 400Hz Mod-into limiting 100KuV or better)	"	"	T101	Adjust for max output.
5	"	98MHz (75KHz deviation @ 400Hz Mod-below limiting)	"	"	T1	Adjust for max output. Repeat steps 3,4 & 5 for optimum peak.

FM RF ALIGNMENT— DO NOT perform Steps 6 & 7 unless the tuner has been tampered with or associated components have been replaced.

6	Ant receptacle thru termination (Fig. B)	109 Mhz (22.5 KHz deviation @ 400Hz Mod - use max sig.)	Hi end stop	VTVM-AC probe or scope across 4.0 ohm output load	TC3	Adjust for max signal output.
7	"	109 Mhz (22.5 KHz deviation @ 400Hz Mod-below limiting)	"	"	TC2, TC1	"

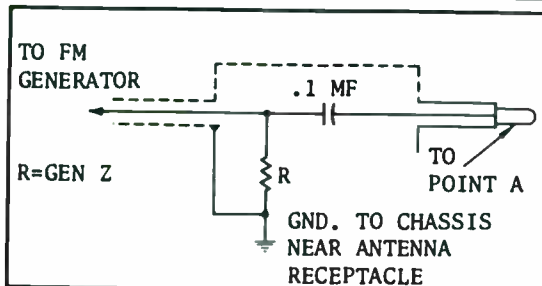


FIG. A - IF GENERATOR TERMINATION

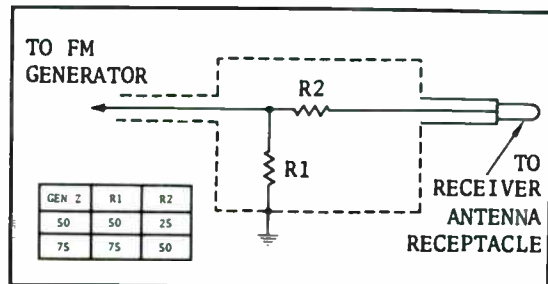


FIG. B - RF GENERATOR TERMINATION

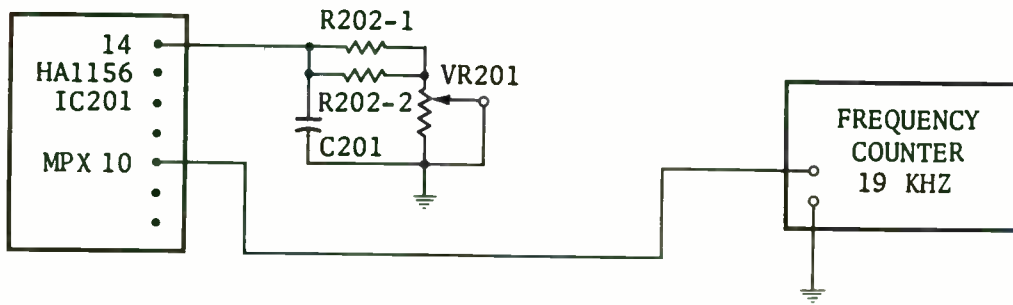


FIG. C VR201 ADJUSTMENT WITH COUNTER

ADJUSTMENT OF VR201

METHOD 1

Ideally, one of the most accurate ways to adjust VR201 would be with the aid of a frequency counter. Connect the counter to pin no. 10 of IC201 as shown in FIG. C. Adjust VR201 for 19kHz as seen on the counter.

METHOD 2

Accurate alignment of VR201 can be obtained by using the output of the stereo IC chip (IC201-pin no. 14). Connect the scope as illustrated in FIG. D and adjust VR201 for minimum waveform as observed on the scope.

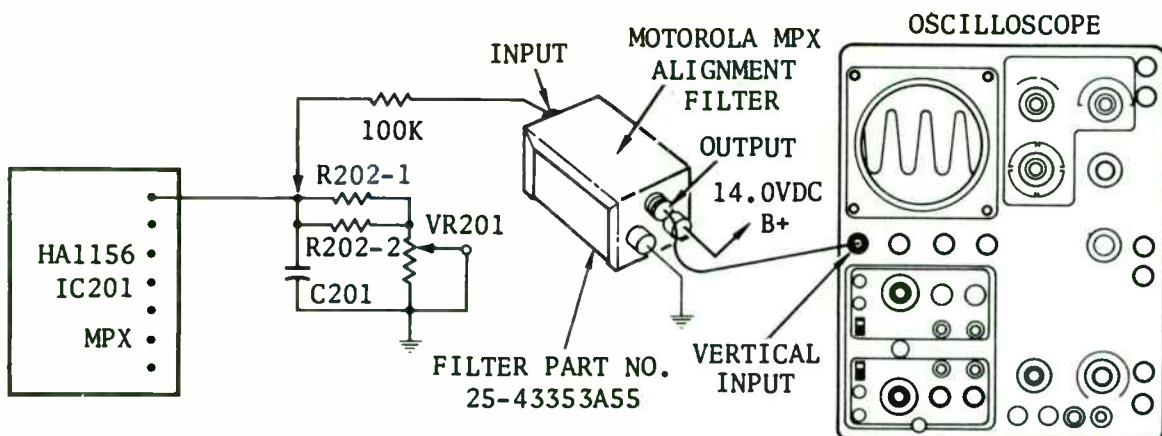
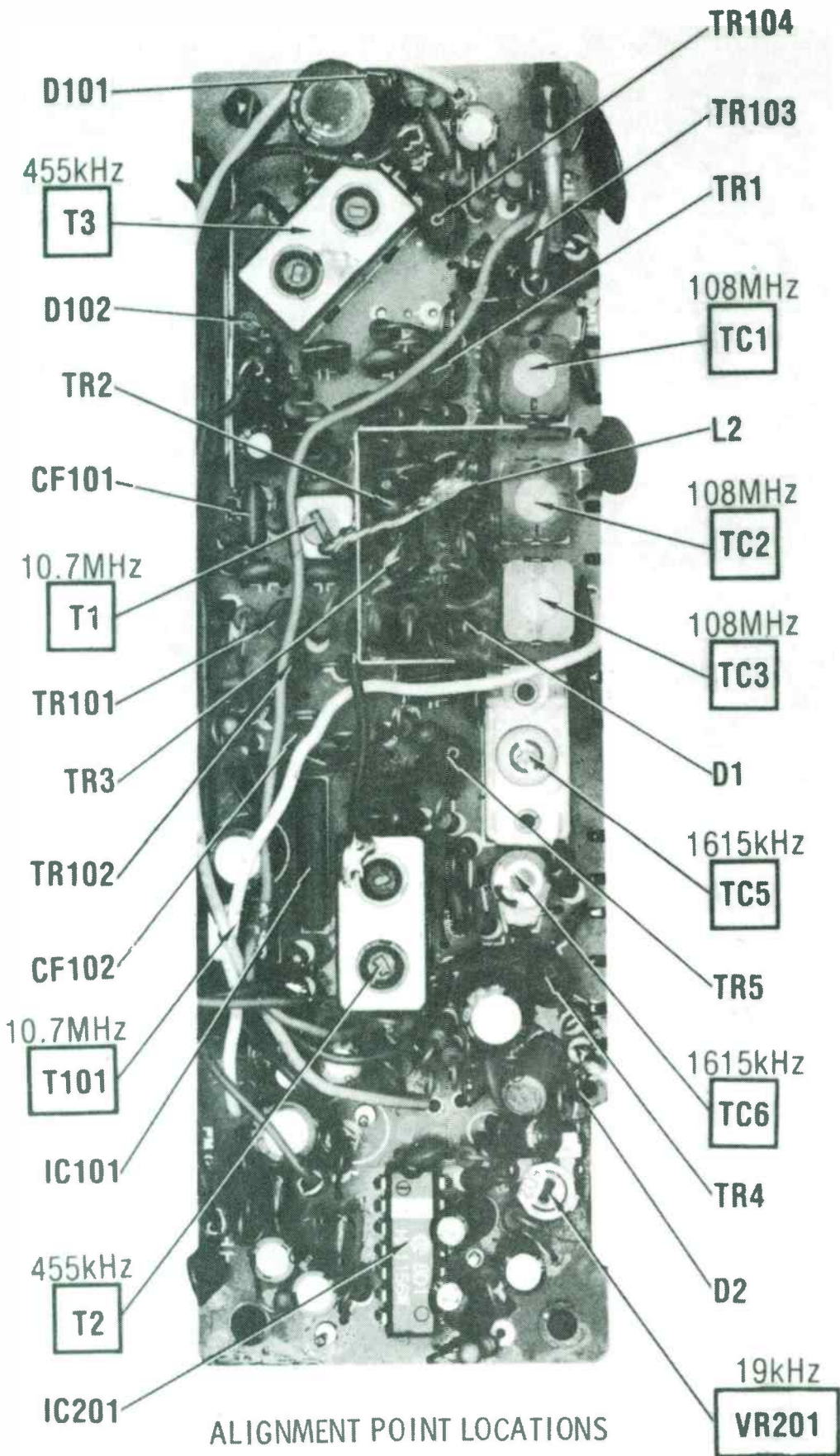
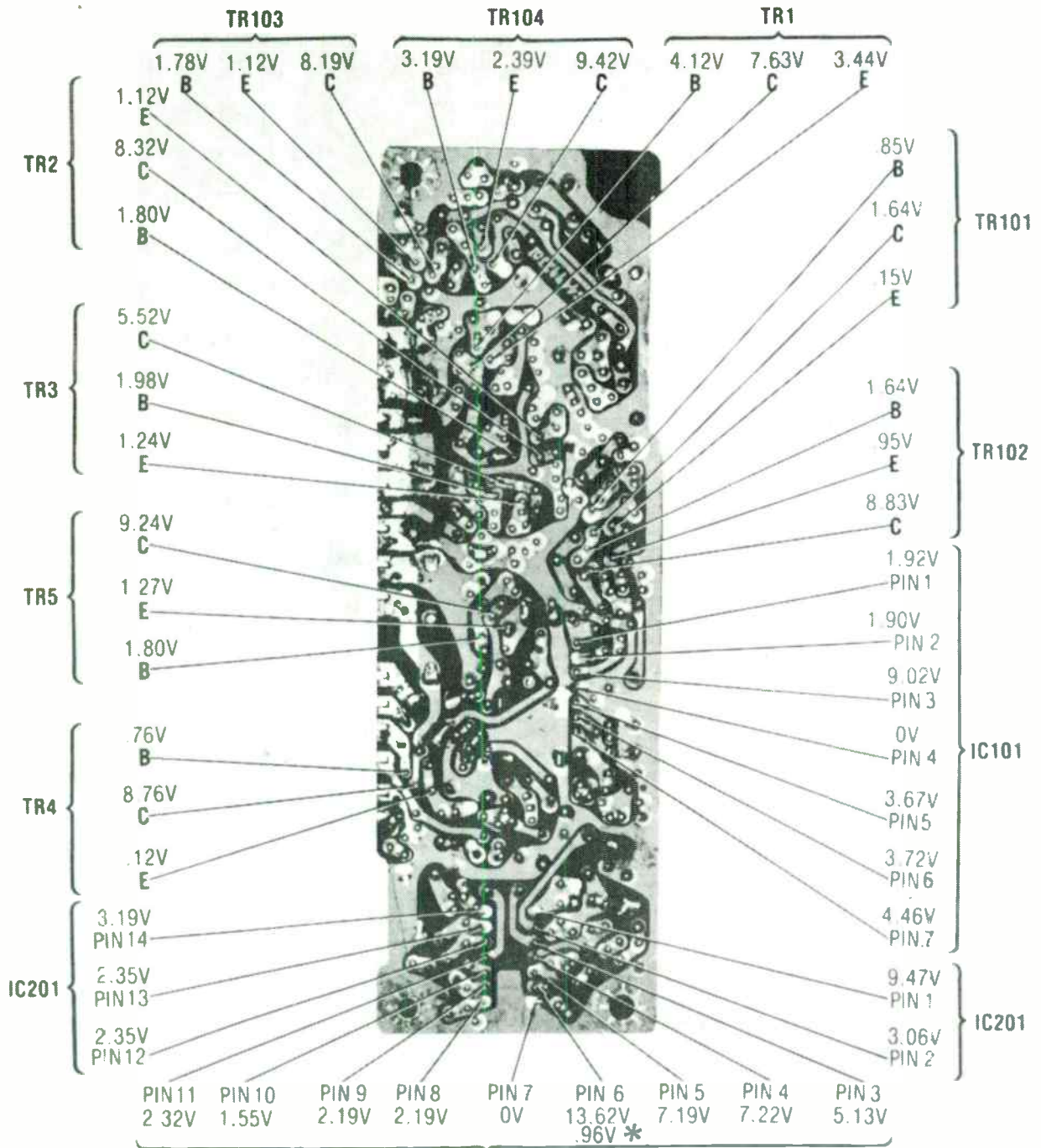


FIG. D VR201 ADJUSTMENT WITH SCOPE

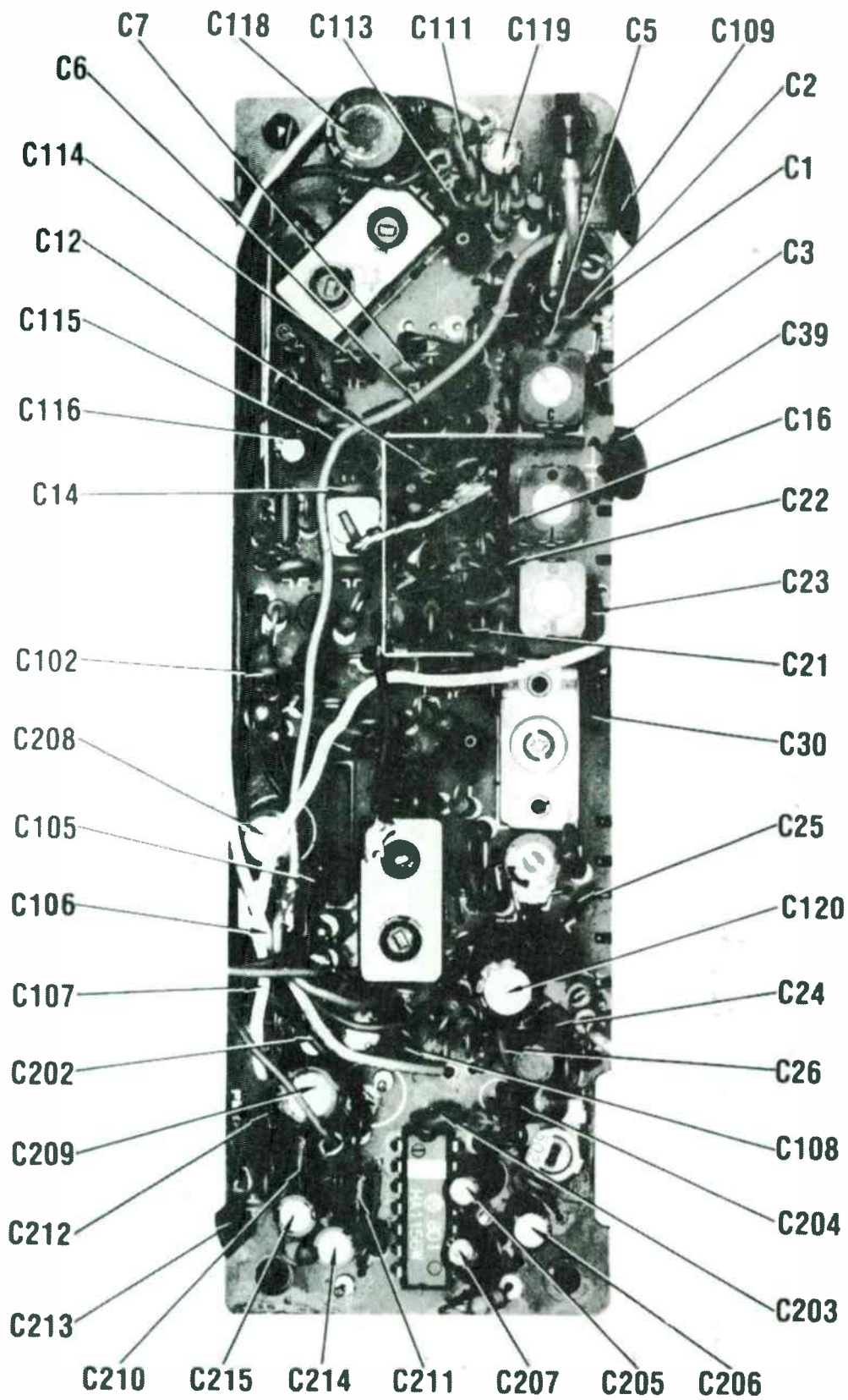




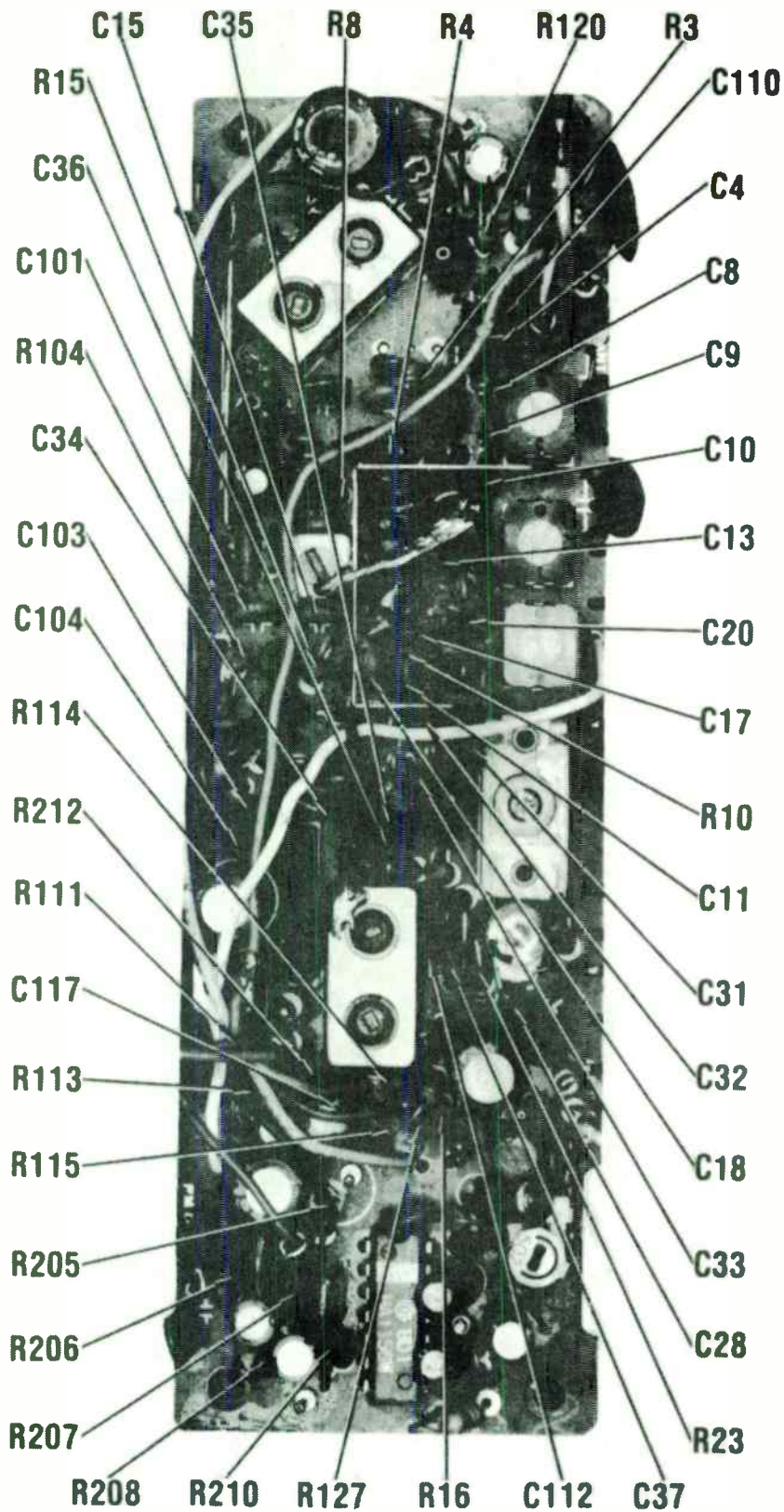
* VOLTAGE TAKEN WITH MPX SIGNAL AT ANTENNA

IC201

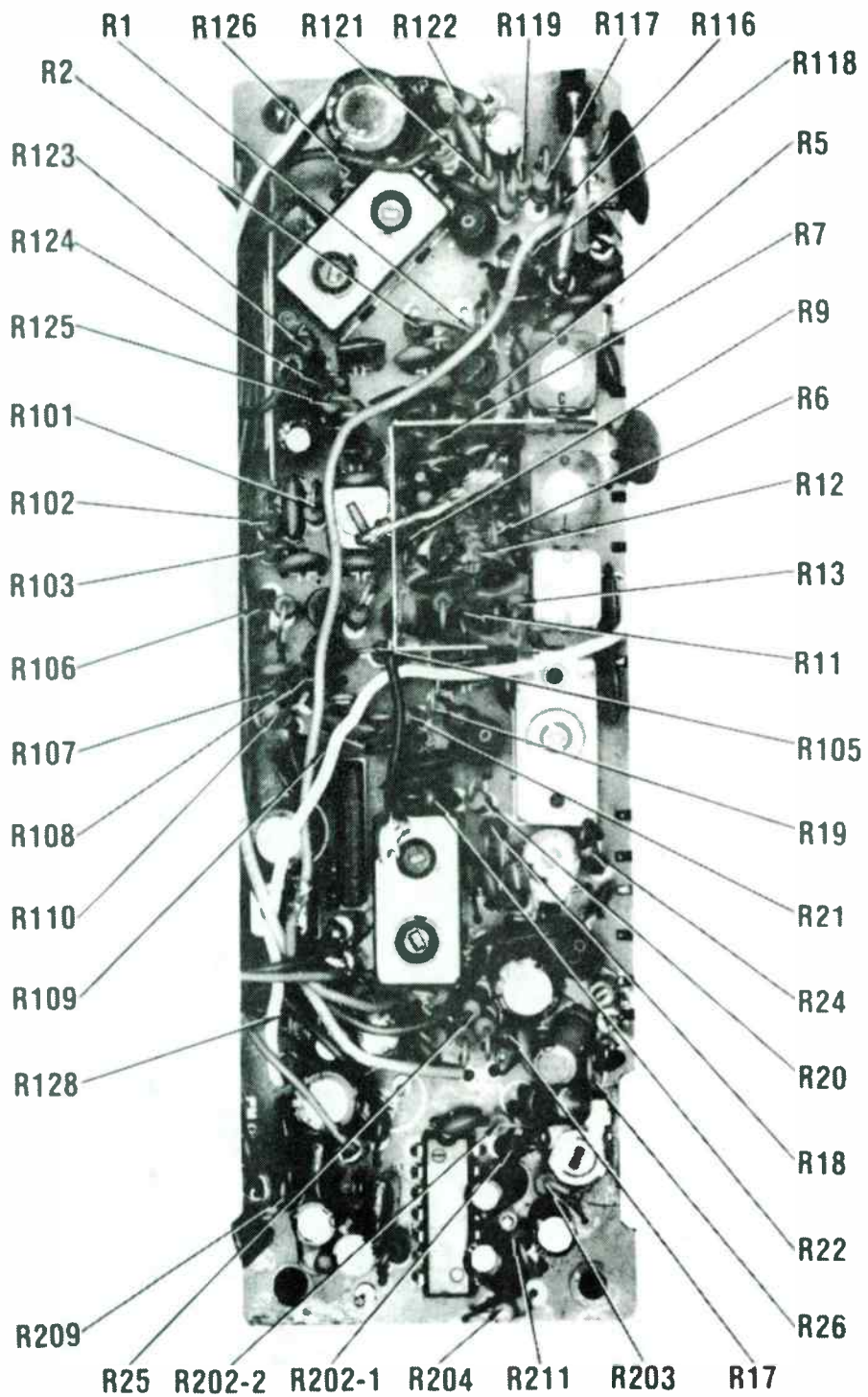
MAIN RADIO BOARD



MAIN RADIO BOARD

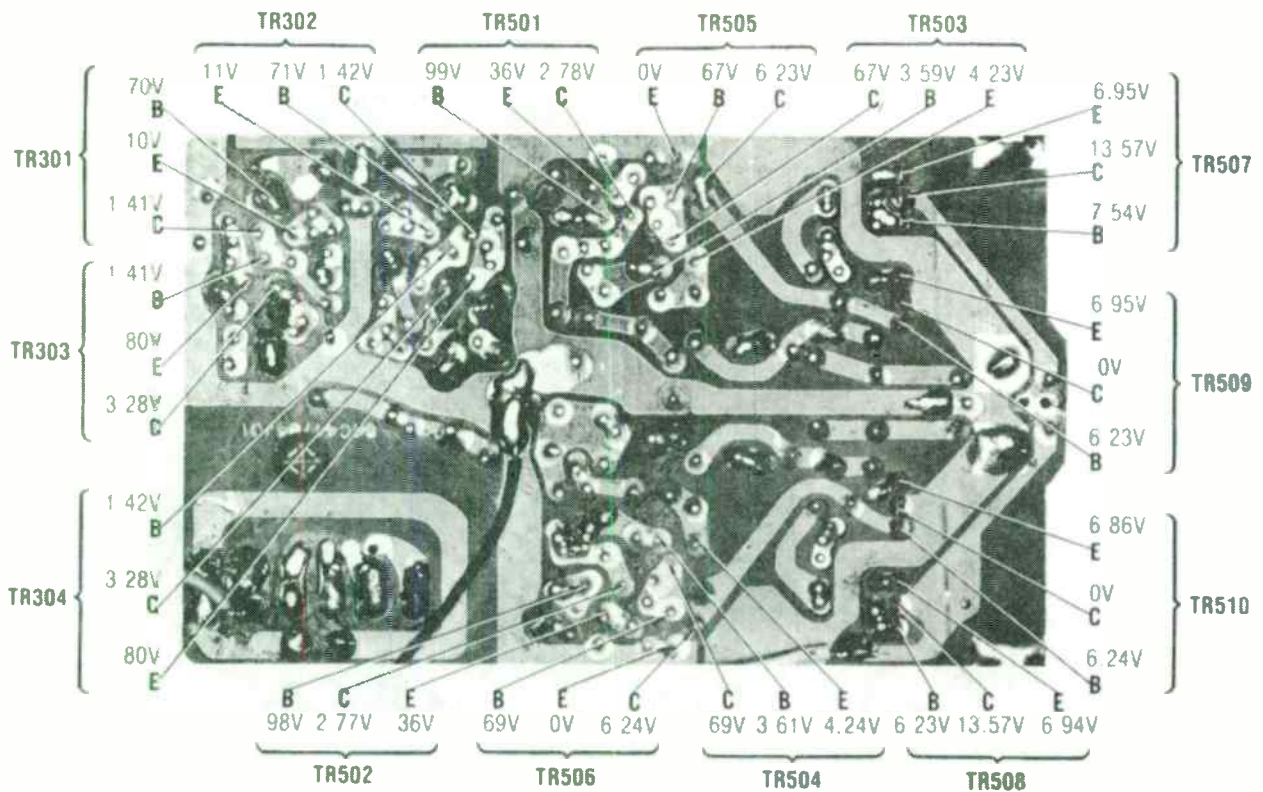
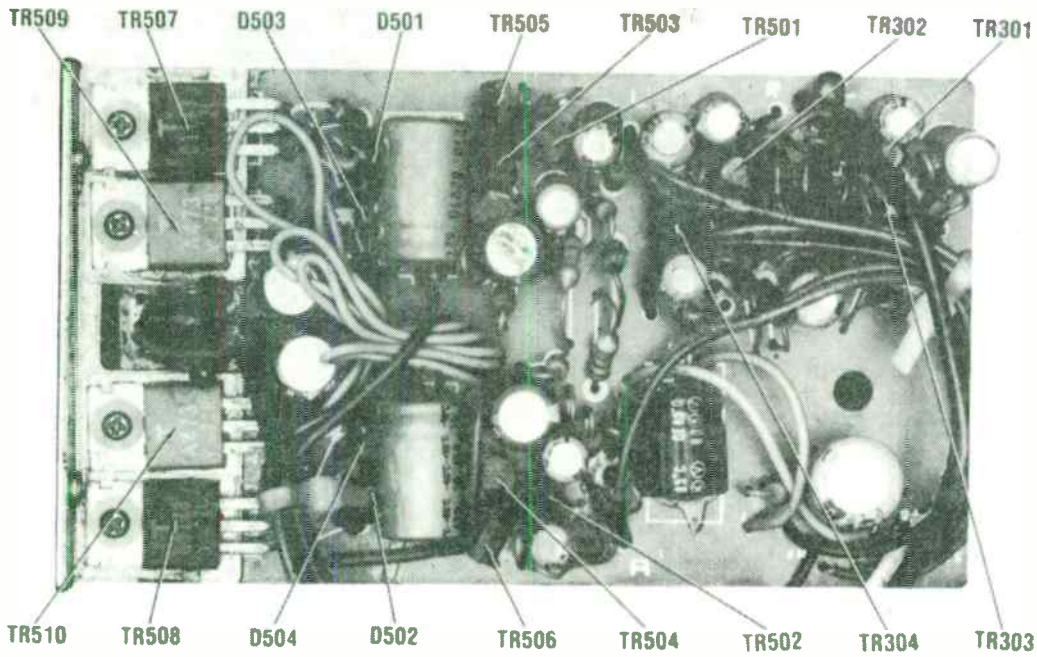


MAIN RADIO BOARD

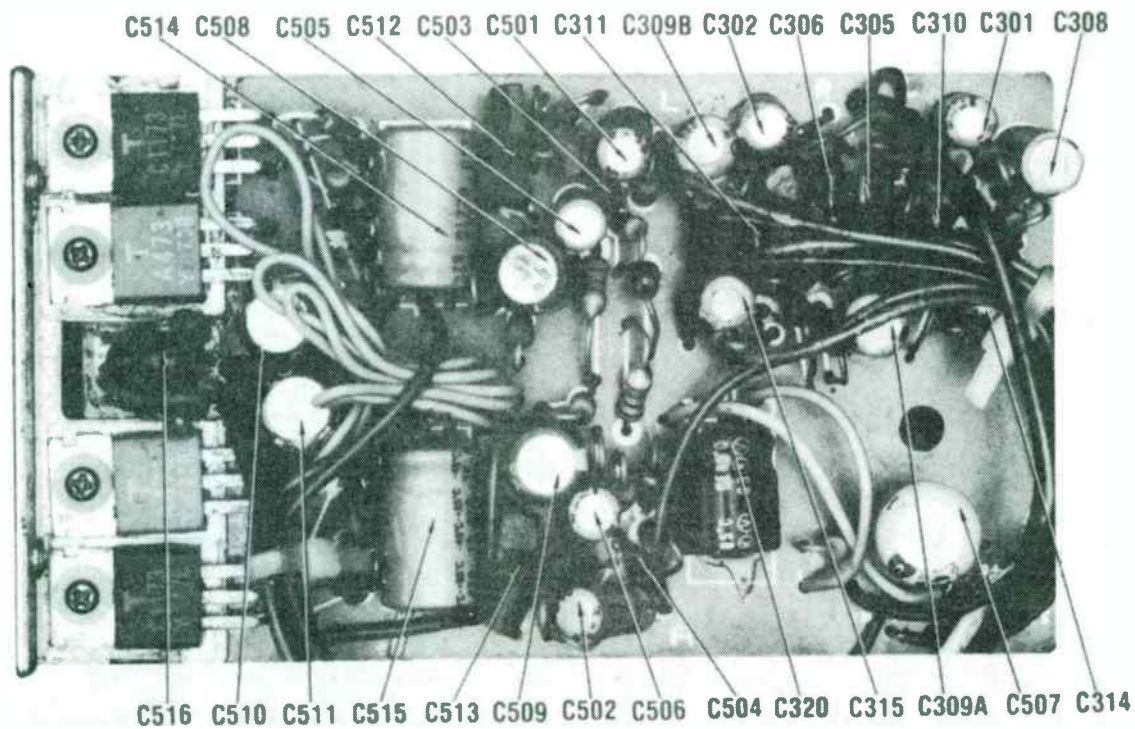
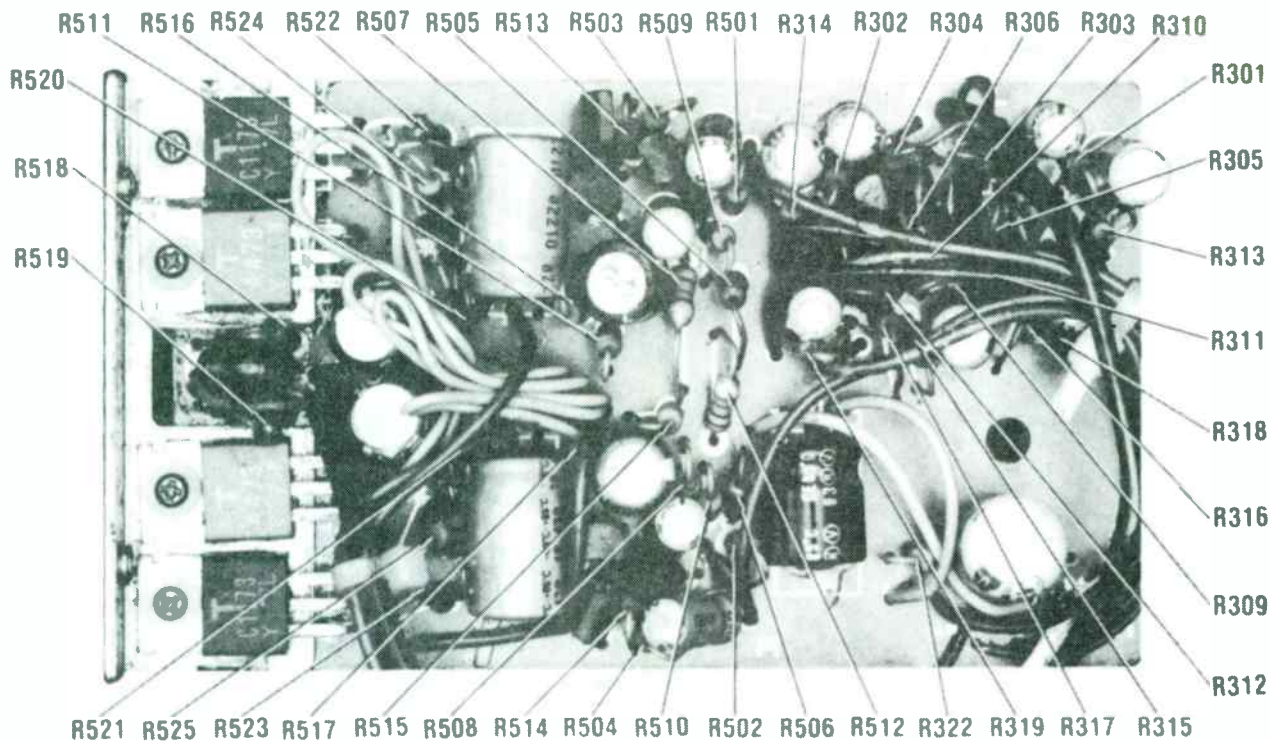


MAIN RADIO BOARD

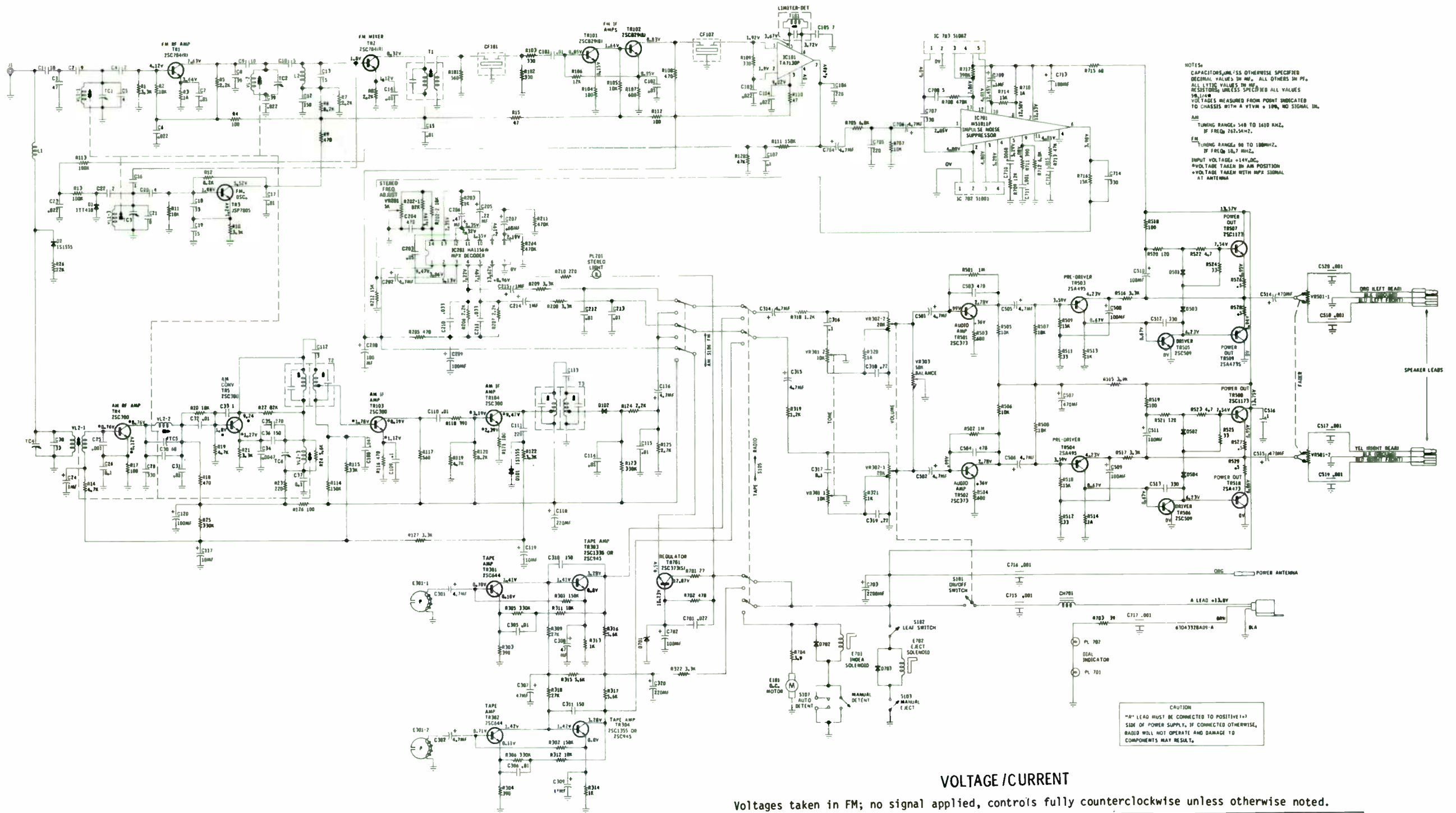
Motorola 3C4TEC8



AUDIO BOARD



AUDIO BOARD



NOTES:
 CAPACITORS UNLESS OTHERWISE SPECIFIED
 ORIGINAL VALUES IN MF. ALL OTHERS IN PF.
 ALL VOLTAGE VALUES TO BE
 MEASURED UNLESS OTHERWISE SPECIFIED ALL VALUES
 50% TOLERANCE UNLESS OTHERWISE SPECIFIED
 VOLTAGES MEASURED FROM POINT INDICATED
 TO CHASSIS WITH A VTRM @ 100K Ω SIGNAL IN.
 AM
 TUNING RANGE: 540 TO 1610 KHZ,
 IF FREQ 162.5 KHZ.
 FM
 TUNING RANGE: 80 TO 108 MHz,
 IF FREQ 16.7 MHz.
 INPUT VOLTAGE: +14V DC.
 *VOLTAGE TAKEN IN AM POSITION
 *VOLTAGE TAKEN WITH MPX SIGNAL
 AT ANTENNA

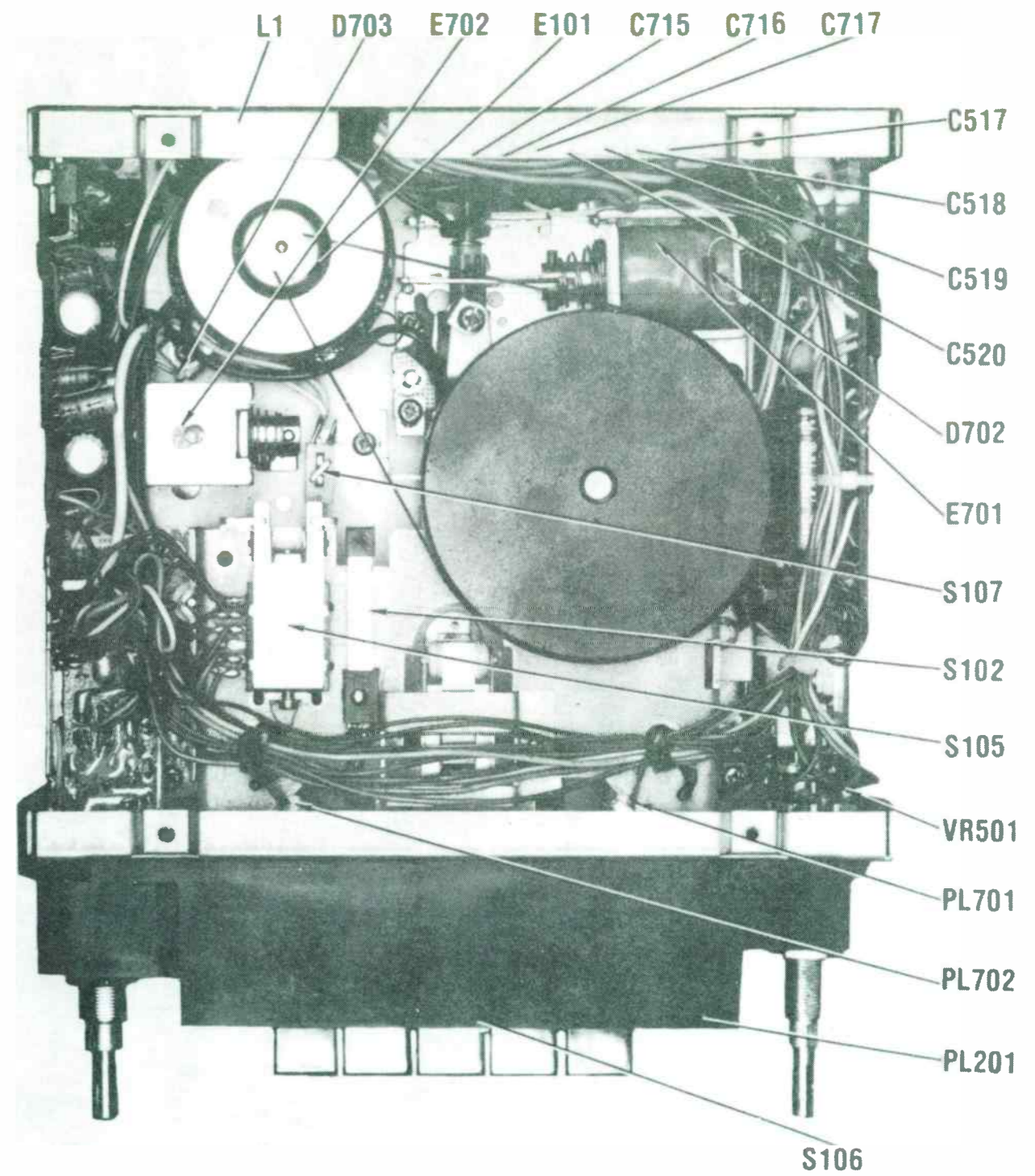
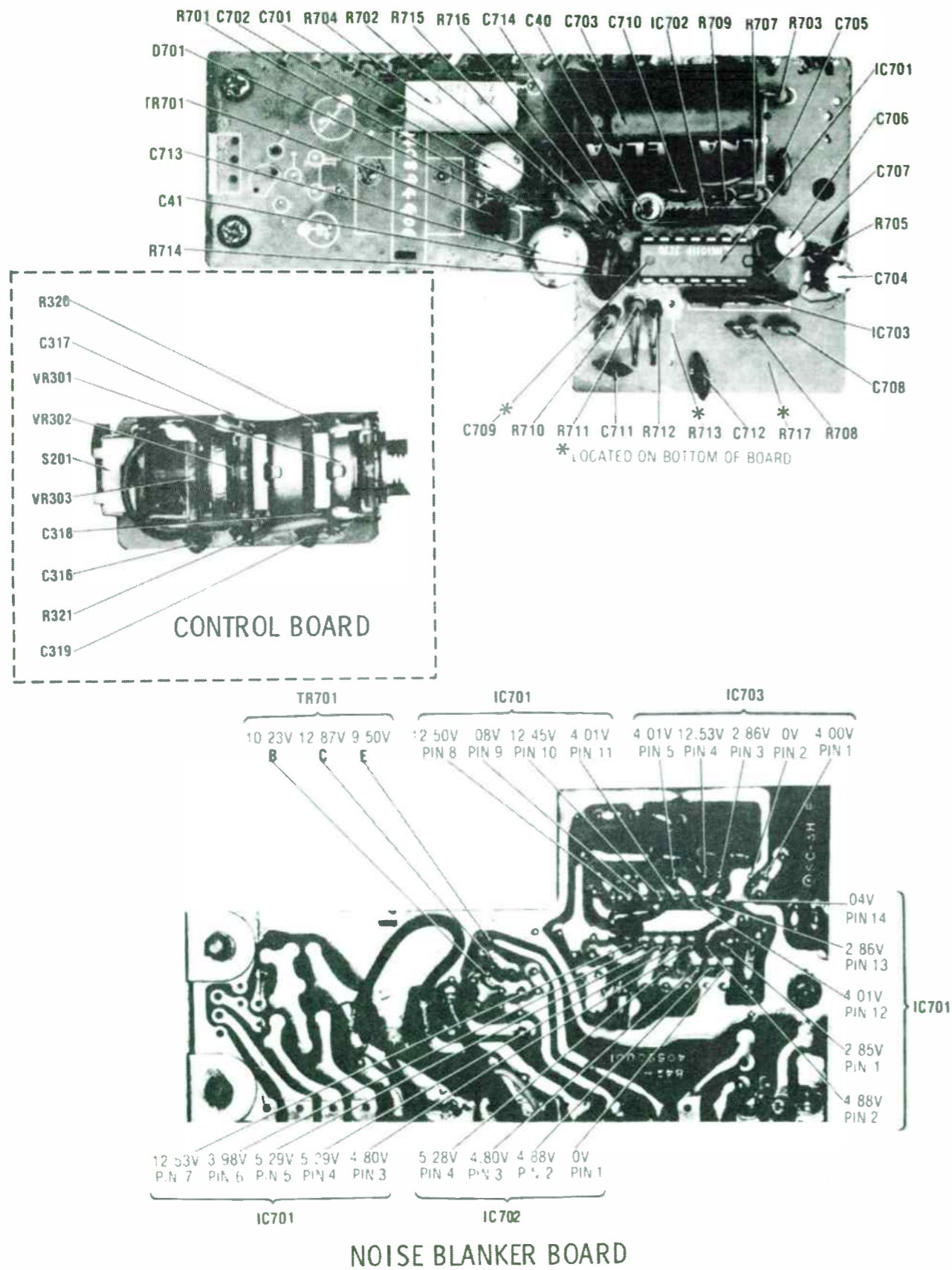
CAUTION
 "A" LEAD MUST BE CONNECTED TO POSITIVE (+)
 SIDE OF POWER SUPPLY. IF CONNECTED OTHERWISE,
 RADIO WILL NOT OPERATE AND DAMAGE TO
 COMPONENTS MAY RESULT.

VOLTAGE /CURRENT

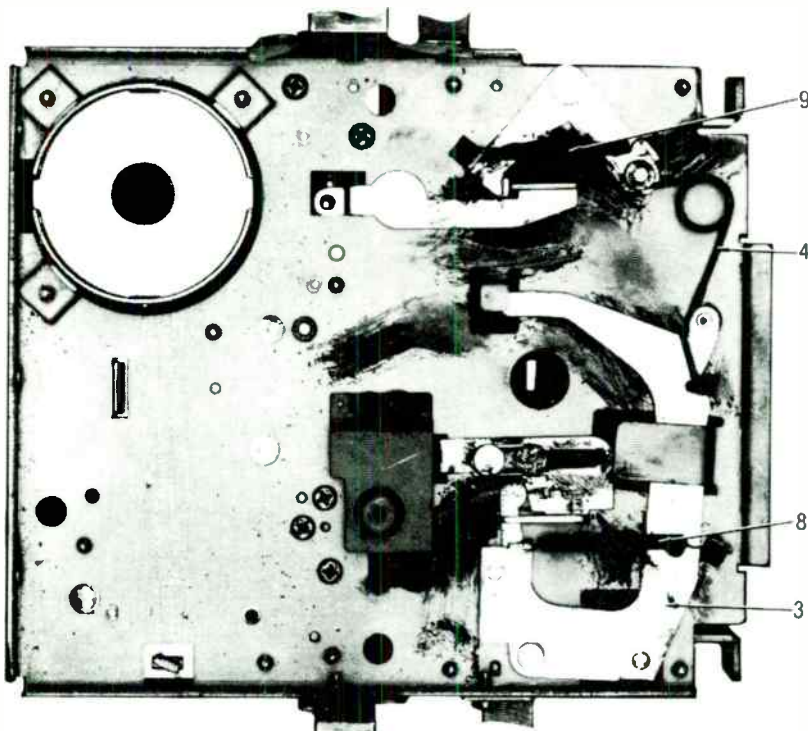
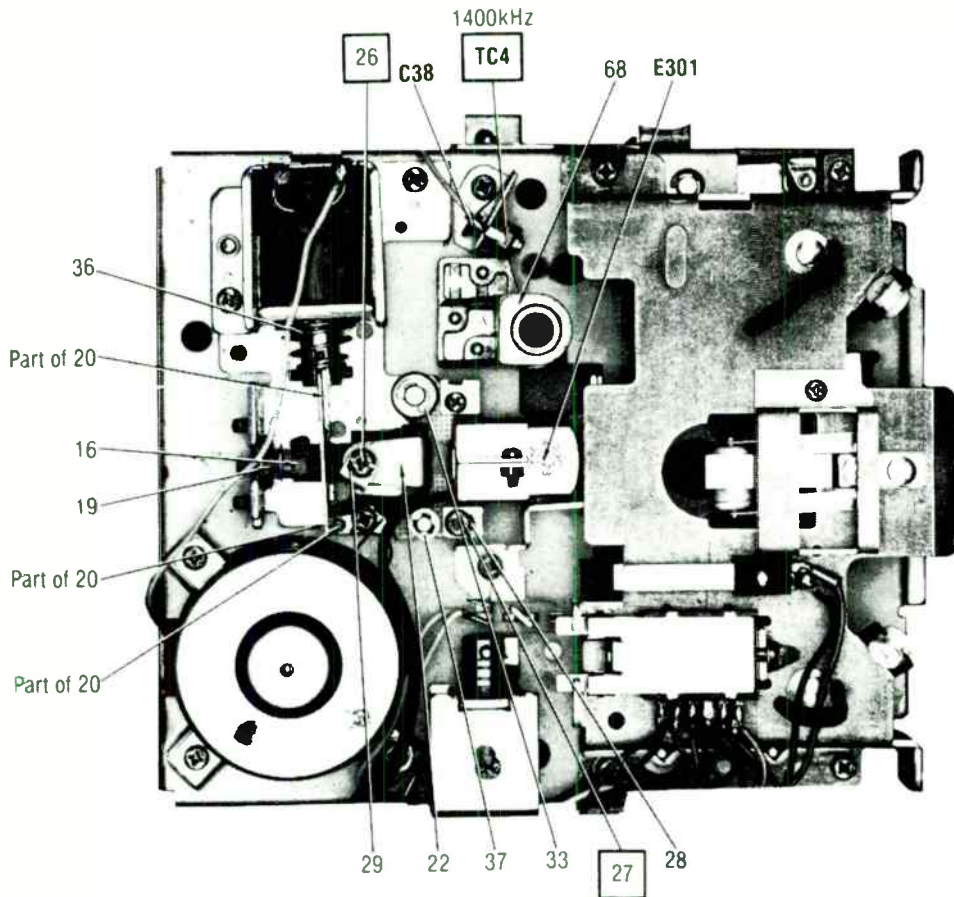
Voltages taken in FM; no signal applied, controls fully counterclockwise unless otherwise noted.

DC INPUT SUPPLY	SOURCE VOLTAGES	LOCATION	LAMPS
13.80V @ 210mA, AM 221mA, FM 250mA, FM Stereo	1. 13.80V	Junction of R515 & R519	PL201 - 40mA @ 6.80V
	2. 7.79V	Junction of R505 & R506	PL701 - 50mA @ 6.90V
	3. 7.59V	Junction of R315 & R322	PL702 - 50mA @ 6.90V
	4. 5.77V	Junction of R309 & R310	
	5. 9.44V	Junction of R114 & R126	
	6. 9.36V	Junction of R23 & R25	
	7. 8.62V	Junction of R105 & R112	
	8. 8.33V	Junction of R6 & R9	

Motorola 3C4TEC8



TAPE DECK PARTS LOCATION



TAPE DECK PARTS LOCATION

NOTE: ALL PARTS LISTED ARE RECOMMENDED REPLACEMENT PARTS.

REF. NO.	PART NUMBER	DESCRIPTION	REF. NO.	PART NUMBER	DESCRIPTION
	MISCELLANEOUS ELECTRICAL PARTS		8	41-43998J01	SPRING, ejector lever; auto
			9	41-43999J01	SPRING, ejector lever
			10	43-40266J02	SPACER, capstan
CF101,			13	3-44205G01	SCREW, tap tite; M3x6
CF102	91-41273J01	FILTER, ceramic: 10.7MHz; REPLACE IN PAIRS (USE 91-43353A72)	16	45-43289J01	CAM RATCHET
			17	41-41943J01	SPRING, lock
E101	59-42201J03	MOTOR, DC	18	4-40070G30	WASHER, flat; 4.2x8x.3: cam ratchet
E301	59-40228J01	HEAD, TAPE	19	* 41-43218J05	SPRING, push: cam
E702	* 1-40100U96	COIL, solenoid	20	1-43700J07	PLUNGER & RATCHET assembly incl. spring, pawls & pin
PL201	* 65-42954P10	BULB, stereo indicator	22	* 7-44802J01	BRACKET, head
PL701,			23	3-40011G98	SCREW, machine; M2: head mtg.
PL702	65-42954P11	BULB, dial light	24	2-40000G26	NUT; M2.3: head mtg.
			25	3-40014G12	SCREW, machine; M2.6: head bracket
	RESISTORS		26	3-43253J02	SCREW, machine; round point: height adj.
	(ALL RESISTORS USED IN THIS RADIO ARE 5% 1/4W EXCEPT THE UNIQUE VALUES LISTED BELOW)		27	3-40011G22	SCREW, machine; M3: head mtg.
R526-			28	41-40889J08	SPRING, coil; azimuth adj.
R529	30-41857J01	.5 5% 5W; WIRE	29	41-40889J05	SPRING, coil; head height adj.
R704	* 17-40577G27	3.9 10% 2W	32	43-43807J01	SLEEVE, guide: azim. & ht. adj.
VR301-1,			33	41-40889J06	SPRING, coil: azim. & ht. adj.
VR301-2	18-44791P01	CONTROL, MULTIPLE: VOL. 20K, TONE 20K	35	* 4-42019G04	WASHER, "C": .119 ID: guide shaft
VR303	18-42061J13	CONTROL, BALANCE: 50K	36	41-41452G01	SPRING, solenoid
VR501-1,			37	41-40889J07	SPRING, coil: ejector lever
VR501-2	18-40231P03	CONTROL, FADER (incl. tuning shaft)	41	49-41580801	ROLLER, cartridge
	SWITCHES		43	* 3-40011G79	SCREW, machine; M2.5x3: lower plt.
S101		SWITCH, ON-OFF (Part of VR301, VR302, VR303)	44	* 49-41244P01	ROLLER, stopper
S102	* 40-40285G03	SWITCH, LEAF SWITCH	46	3-40019G71	SCREW, F lock
S103	* 40-40695P01	SWITCH, MANUAL/EJECT	47	1-40600P18	PLUNGER, assembly: incl. pin
S105	40-42635P01	SWITCH, TAPE/RADIO	51	* 1-40100U97	BOARD, PLATED: FILTER (complete)
S106	* 40-44108J01	SWITCH, AM/FM	54	3-40011G21	SCREW, machine; M3x4: SW panel
S107	* 40-40285J08	SWITCH, AUTO DETENT	55	* 1-40100U98	BOARD, PLATED: PRE-AMP (complete)
	TRANSISTORS		57	3-40011G57	SCREW, machine; M2x5: TR mtg.
TR1,			58	43-41691G01	SPACER, transistor
TR2	48-45315G01	2SC784-R - FM RF AMP & MIXER	59	14-40472G02	INSULATOR, transistor
TR3	48-43992J01	JSP7005 - FM OSC.	60	* 1-40100U99	BOARD, PLATED: VOL. (complete)
TR4,			62	3-40011G58	SCREW, machine; M2.6x4: filter bd. mtg.
TR5	48-42191G01	2SC380-0 - AM RF AMP & CONV.	64	3-40018G02	SCREW, tapping; M3x8: clamp mtg.
TR101,			68	1-43400J90	CAPSTAN HOUSING assembly: incl. SL. brng.
TR102	48-41815J02	2SC829-B - FM IF AMP	69	4-40246A01	WASHER, "C": .211 capstan
TR103,			70	* 49-40631P01	FLYWHEEL & SHAFT
TR104	48-42191G01	2SC380-0 - AM IF AMP	71	* 41-41184P01	SPRING, solenoid eject
TR301,			72	42-40818G01	BELT, drive
TR302	48-41349J02	2SC644 - 1st TAPE PRE-AMP	73	3-40018G01	SCREW, tapping: M3x6
TR303,			74	3-44205G03	SCREW, tape tite; M3x8: sub chassis
TR304	48-44578J01	2SC945L-P - 2nd TAPE PRE-AMP	75	4-40074G04	WASHER, flat: capstan hsng.
TR501,			76	43-42072J01	BUSHING, lamp holder
TR502	48-40170G01	2SC373 - 1st AUDIO PRE-DRIVER	77	* 1-42000P03	SWITCH BRACKET assembly: incl. SW. link, spring & studs
TR503,			79	3-40011G33	SCREW, machine; M2x4: SW. brkt. mtg.
TR504	48-43238G01	2SA495 - 2nd AUDIO PRE-DRIVER	80	* 77-42350P01	TUNER; AM/FM pushbutton
TR505,			81	52-44783J01	EXTENSION, pointer
TR506	48-43240G02	2SC1173-0 - AUDIO DRIVER	82	* 52-44753J01	POINTER
TR507,			83	47-44760J01	SHAFT, pointer
TR508	48-43240G01	2SC1173Y - AUDIO POWER OUTPUT	84	4-42091G12	WASHER, "C"
TR509,			85	* 1-40200U07	EJECTOR SWITCH assembly; incl. 86, 87, 88 & 103
TR510	43-43241G01	2SA473Y - AUDIO POWER OUTPUT	87	3-40011G31	SCREW, machine; M2x4: S103 mtg.
TR701	48-40170G01	2SC373 - CAPACITY MULTIPLIER	88	3-44205G07	SCREW, tapping; M2.6x5: S103 mtg.
	TRANSFORMERS		91	3-44205G01	SCREW, machine; M3x5L: pointer
T1	24-44507J01	COIL, IF FM	92	* 36-42122P01	PUSHBUTTON, station selector
T2	24-64670B01	COIL, IF AM (pink)	93	* 36-40304U01	PUSHBUTTON, eject
T3	24-64670B02	COIL, IF AM (yel)	94	* 41-42613P02	SPRING, pointer tension
T101	24-44795J01	COIL, IF FM	95	41-42612P01	SPRING, pointer tension
	MECHANICAL PARTS		98	* 1-40200U08	BOARD, PLATED: RADIO (complete)
3	* 1-44803J01	EJECTOR LEVER assembly: incl. roller	101	* 7-44748J01	BRACKET, fader guide
4	41-44643J01	SPRING, ejector lever			
6	4-40246A06	WASHER, "C": .102 ID: eject			
7	4-42091G01	WASHER, "C": .059 ID: eject			

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

* DENOTES NEW ITEM APPEARING IN ANY LIST FOR THE FIRST TIME.

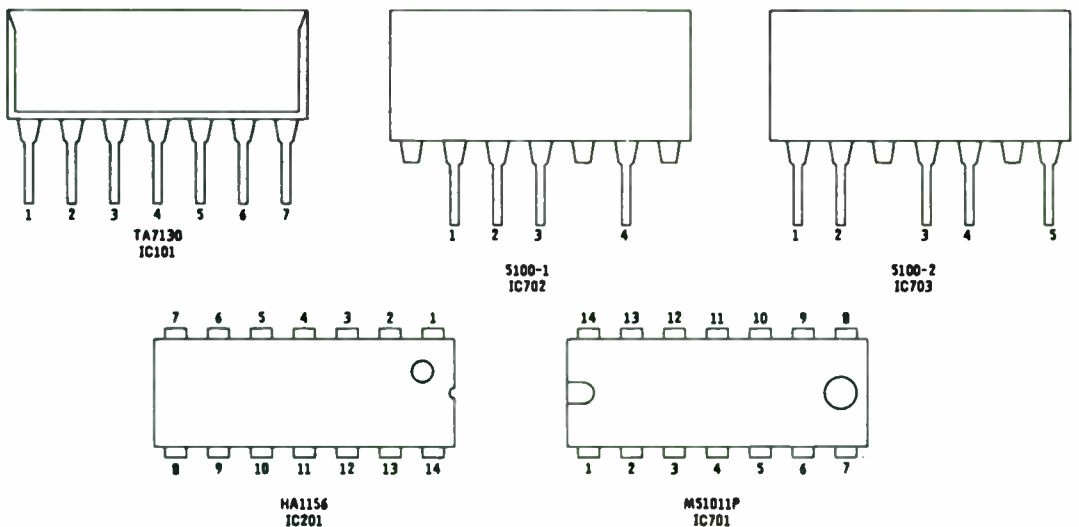
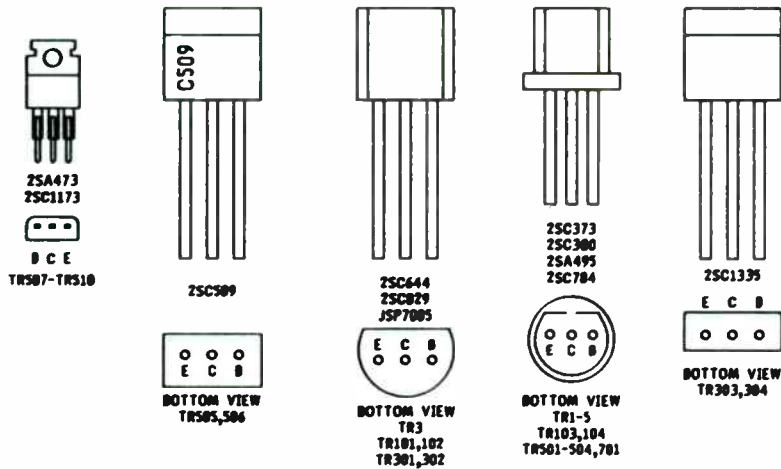
NOTE: ALL PARTS LISTED ARE RECOMMENDED REPLACEMENT PARTS.

REF. NO.	PART NUMBER	DESCRIPTION	REF. NO.	PART NUMBER	DESCRIPTION
MECHANICAL PARTS (Cont.)			118	3-40012G47	SCREW, tapping; M2.6x8: slide bar
102	7-44745J01	BRACKET, fader control	119A	* 1-43362A11	DOOR, tape; assembly; incl. 119-124 & 84
103	44-44873J02	GEAR, drive: main mtg.	128	2-40000G24	NUT, hex; M9x0.75: vol. & fader; outer
104	7-44744J01	BRACKET, drive gear	129	4-43020G06	WASHER, flat; 9.2x19x1: vol. & fader
105	44-44873J01	GEAR, drive: "D" ID	J1	9-42905J01	RECEPTACLE, antenna
106	7-44857J03	STABILIZER, fader control	J2	* 1-40889P05	CABLE, "A" lead
107	43-43185G01	SPACER, shaft: REF. 103 mtg.	J3	* 1-42187J02	CABLE, power ant. (wht)
108	47-40620P01	GUIDE, fader control	J4	* 1-42187J07	CABLE, dim (brn)
109	* 4-40305U01	WASHER, vol. & tune guide	J5	30-42688J08	CABLE, spkr: left (org, blk, blu)
111	2-40000G20	NUT, hex; 1.79x0.7: vol. & fader	J6	30-42688J07	CABLE, spkr: right (yel, blk, red)
112	4-42792J06	WASHER, spacer: fader		*1-42700P95	KIT, INSTALLATION
114A	* 1-43362A09	ESCUTCHEON, assembly; complete incl. 114-124 & 84			
115A	* 1-43362A10	SLIDE BAR assembly; incl. 115-118			

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TERMINAL GUIDES



INDEX

Listing all models in Auto Radio Series volumes from 1970 (AR-70).

For models covered before 1970, see the Annual Index.

(EP) Early Production (LP) Late Production (SN) Serial Number (Rev) Revised (PCB) Production Change Bulletin

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(CONT.)			(CONT.)			(CONT.)			(CONT.)			(CONT.)			(CONT.)		
AFX810	216	2RS1016	86	5355092	229	1VW4112	124	C940	99	CVA75DLX/B	235						
AG52	222	5AM1608	229	5451456	167	1VW4309	179	C950	99	CVA75MXD	216						
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IDC650AE	231	5AM3604/3605	231	5463943	278	5VW1327	155	C974	131	DA73MPX (Pg 45)	136						
SB480	223	5AM3704 (Pg 29)	231	5463944	277	5VW1419	192	C975	138	DA73PB (Pg 21)	136						
SC700	224	5AM4609	236	8122605	279	5VW1601	279	C976	160	DA74FM (Pg 21)	133						
SCX900	226	5AM4610	236	8678035	167	5VW2335	181	C977	182	DA74MPX (Pg 45)	136						
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		5HT1409	167	8991829	83	5VW3401	193	C979	182	DA75CXP	218						
		5HT1509	212	8991835	86	5VW3608	281	C980	139	DA75DLX/B	235						
		5HT1510	212	8991836	84	5VW4309	179	C983 (Pg 15)	166	DA75TPX/A	219						
		5HT1707/8	274	8991989	82	5VW4412	201	C984	187	DCF75CXP	218						
		5HT1801/2	278	8992206	82	5VW4419	191	C986	206	DCF75DLX/B	235						
		5HT2409	170	8992252	83			C986A	269	DCF75QDX	226						
		5HT2511	219	8992290	82	AUDIOVOX		C986C	288	DCF75TPX/A	219						
		5HT2805	279	8992416	86	AMIC	179	C990	162	DGC10	287						
		5HT3510	216	8992417	84	AMF15	192	C993	283	DMD75CXP	218						
		5HT3607	231	8992522 (2HT1244)	133	BAP73FM (Pg 21)	133	C997B	284	DMD75DLX/B	235						
		5HT3804	277	8992522 (2HT1303)	166	BAP73MPX (Pg 45)	136	CA73FM (Pg 21)	133	DMD75QDX	226						
		5JC1602	229	8992523	166	BAP73MPX (Pg 45)	136	CA73MPX (Pg 45)	136	DMD75TPX/A	219						
		5JC1603/613	234	8992525	166	BAP73PB (Pg 21)	136	CA73PB (Pg 21)	136	DST73FM (Pg 21)	133						
		5JC1709	274	8992770 (1RA1226)	155	BAP74FM (Pg 21)	133	CA74FM (Pg 21)	133	DST73MPX (Pg 45)	136						
		5JC1803/7	278	8992770 (1RA1301)	166	BAP74MPX (Pg 45)	136	CA74MPX (Pg 45)	136	DST73PB (Pg 21)	136						
		5JC3603	231	8992771	131	BAP74PB (Pg 21)	136	CA74PB (Pg 21)	136	DST74FM (Pg 21)	133						
		5JC3802	277	8992829 (1JA1227)	133	BKS73FM/MPX	181	CA75CXP	218	DST74MPX (Pg 45)	136						
		5KJ1405	167	8992829 (1JA1305)	166	BKS73PB	174	CA75DLX/B	235	DST74PB (Pg 21)	136						
		5KJ1511	212	8992831	157	BKS74FM/MPX	181	CA75MXD	216	DTN71FM (Pg 5)	137						
		5KJ2405	169	8992833 (1HT1224)	133	BKS74PB	174	CA75TPX/A	219	DTN610FM (Pg 5)	93						
		5KJ3511	216	8992833 (1HT1303)	166	BKS75CXP	218	CAD75CXP	218	DTN620FM (Pg 5)	94						
		5RA1507	212	8992861 (1HT2212)	136	BKS75DLX/B	235	CAD75DLX/B	235	DTN1200FH	154						
		5RA1508	212	8992861 (1HT2306)	170	BKS75MXD	216	CAD75MXD	216	DTN1200PB	155						
		5RA1524	212	8992927	171	BKS75QDX	226	CAD75QDX	226	DTN73FM (Pg 5)	137						
		5RA1525	212	8992928	170	BKS75TPX/A	219	CAD75TPX/A	219	DTR73MPX	177						
		5RA2404	200	8992953	153	BU73FM/HPX	285	CAS500	270	DTR73PB (Pg 5)	138						
		5RA2510	219	8993042	169	BLM105031	290	CAS600	268	DTR74FM (Pg 5)	137						
		5RA2520	219	8993043	169	BU73FM/MPX	181	CH73FM/MPX	181	DTR74MPX	177						
		5RA3509	216	8993281 (Pg 29)	231	BU73PB	174	CH73PB	174	DTR74PB (Pg 5)	138						
		5RA3517	216	8993382 (Pg 5)	236	BU74FM/MPX	181	CH74FM/MPX	181	DTR75CXP	218						
		5RA4503	217			BU75DLX/B	235	CH74PB	174	DTR75DLX/B	235						
		5RA4518	217			BU75DLX/B	235	CH75CXP	218	DTR75TPX/A	219						
		5SMG	82			BU75MXD	216	CH75DLX/B	235	DVA73FM (Pg 5)	137						
		9SMR	86			BU75QDX	226	CH75MXD	216	DVA73MPX	177						
		3231847/48/49/50	290			BU75QDX	226	CH75QDX	226	DVA73PB (Pg 5)	138						
		3591052	87			BU75TPX/A	219	CH75TPX/A	219	DVA74FM (Pg 5)	137						
		3601578	87			C80	90	CH73DLX (Pg 21)	160	DVA74MPX	177						
		3614434	86			C110	133	CHT73FM/MPX	181	DVA74PB (Pg 5)	136						
		3614435	86			C405	138	CHT73PB	174	DVA75CXP	218						
		3616442	84			C406	183	CHT74DLX (Pg 21)	160	DVA75DLX/B	235						
		3631192	82			C410	92	CHT74FM/MPX	181	DVA75TPX/A	219						
		3631193	83			C420	93	CHT74PB	174	ECO73FM (Pg 5)	138						
		3632704	122			C440	96	CHT75CXP	218	ECO73MPX	177						
		3651039	133			C463	135	CHT75DLX/B	235	ECO73PB (Pg 5)	138						
		3664162	200			C480	136	CHT75TPX/A	219	ECO74FM (Pg 5)	137						
		3665160	212			C505	137	CK73FM (Pg 5)	137	ECO74MPX	177						
		(2RA/5RA1508)	212			C506 (Pg 5)	137	CK73MPX	177	ECO74PB (Pg 5)	138						
		3665160 (2RA1402)	167			C506B	227	CK74FM (Pg 5)	137	ECO75CXP	218						
		3665161 (1RA/2RA/5RA1508)	212			C510	92	CK74MPX	177	ECO75DLX/B	235						
		3665161 (2RA1410)	167			C520	94	CNO73FM (Pg 21)	133	ECO75TPX/A	219						
		3665162	216			C520A	138	CNO73MPX (Pg 45)	136	FCC73FM (Pg 5)	137						
		3665164	171			C520C	221	CNO73PB (Pg 21)	136	FCC73MPX	177						
		3665914	166			C520D	285	CNO74FM (Pg 21)	133	FCC74FM (Pg 5)	137						
		3672718 (1HT2409)	200			C520E	221	CNO74MPX (Pg 45)	136	FCC74MPX	177						
		3672718 (1HT2409)	170			C525A	285	CNO74PB (Pg 21)	136	FDT73FM/MPX	181						
		3672718 (5HT3607)	231			C540	136	CNO75CXP	218	FDT73PB	174						
		3672718 (5HT3607)	216			C560	94	CNO75DLX/B	235	FDT74FM/MPX	181						
		3674344 (1HT/2HT/5HT1509)	212			C563	135	CNO75MXD	216	FDT74PB	174						
		3674344 (2HT1432)	167			C565	94	CNO75TPX/A	219	FDT75CXP	218						
		3676501	217			C575	93	CO73FM (Pg 5)	137	FDT75DLX/B	235						
		3678002	167			C575A	177	CO73MPX	177	FDT75TPX/A	219						
		3678003	167			C575B	220	CO74FM (Pg 5)	137	FGA75CXP	218						
		3678005	167			C575C	290	CO74MPX	177	FGA75DLX/B	235						
		3678032	172			C576	93	CP650	218	FGA75FDX	222						
		3678035	212			C577A	136	CP750	289	FGA75FFX	226						
		3678159	171			C577A	214	CP1100	273	FGA75QDX	223						
		3690419	217			C578	209	CPR73FM (Pg 5)	137	FGA75TPX/A	219						
		3690420	212			C579	220	CPR73MPX	177	FMK73FM/MPX	181						
		3690421	212			C579A	290	CPR73PB (Pg 5)	138	FMK73PB	174						
		3690422	216			C700	133	CPR74FM (Pg 5)	137	FMK74FM/MPX	181						
		3691020	229			C700A	214	CPR74MPX	177	FMK74PB	174						
		3691021	229			C701	202	CPR74PB (Pg 5)	138	FMK75CXP	218						
		3691022	231			C901	215	CPR75TPX/A	219	FMK75DLX/B	235						
		3691023	236			C902	224	CTV73PB (Pg 21)	136	FMK75FDX	222						
		3691024	239			C903	186	CTV74PB (Pg 21)	136	FMK75FFX	223						
		3691025	229			C905	184	CTV75TPX/A	219	FMK75QDX	226						
		3691026	231			C910	191	CVA73FM/MPX	181	FMK75TPX/A	219						
		3697362/63	278			C915	132	CVA73PB	174	FMU73FM/MPX	181						
		3697364	277			C920	134	CVA74FM/MPX	181	FMU73PB	174						
						C930	91	CVA74PB	174	FMU74FM/MPX	181						
						C935	95	CVA75CXP	218	FMU74PB	174						

AUDIOVOX (CONT.)	VOL.	AUDIOVOX (CONT.)	VOL.	AUTOMATIC	VOL.	AUTOMATIC (CONT.)	VOL.	AUTOMATIC (CONT.)	VOL.	AUTOMATIC (CONT.)	VOL.
FMU75CXP	218	OMA73PB (Pg 21)	136	ACE3113	161	CSL4024	159	GM61	242	NOA4117	176
FMU75DLX/B	235	OMA74FM (Pg 21)	133	ACP3109	161	CSP4726	171	GM67	245	NOE4517	168
FMU75TPX/A	219	OMA74MPX (Pg 45)	136	ACS6000	73	CSX4479	170	GME7	168	NOF4270	169
FMX20	196	OMA74PB (Pg 21)	136	ACY3117	161	CSX5479B	241	GPFA294	169	NOL4015 (Pg 5)	159
F073FM/MPX	181	OML71FM (Pg 5)	137	AFC1303	175	CSX6479A	241	GPFS294B	239	NOX4475 (Pg 15)	165
F073PB	174	OPL71PB (Pg 5)	93	AFP3103	161	CTL4001 (Pg 5)	159	GPFF6294A	239	NPB2408	270
F074FM/MPX	181	OPL75TPX/A	219	APC3107	161	CVA4113	176	GPL4041 (Pg 5)	159	NPP2349	176
F074PB	174	OTN73FM/MPX	181	APP2563	161	CVE4513	168	GPP3733	171	NPX2390	168
F075CXP	218	OTN73PB	173	APP2567	161	CVF4298	169	PPP4733	171	NPX2390F	225
F075DLX/B	235	OTN74FM/MPX	181	APX2334	120	CVF5298B	239	GPX4459	170	OE3026A	159
F075FDX	222	OTN74PB	174	ASK3129	161	CVF6298A	239	GPX5459B	241	OFA3390	175
F075FFX	223	PAC75CXP	218	ATC3127	161	CVM4013	159	GPX6459A	241	OFD3247	172
F075QDX	226	PAC75DLX/B	235	AUF2565A	172	CVF4714	171	GXP3459	167	OFM1869	131
F075TPX/A	219	PAC75TPX/A	219	AUX2340	174	CVX4481	170	GXP3459B	170	OPM2215	131
FPT73FM/MPX	181	PAT75QDX	226	AVA3105	161	CVX4653	177	GXP3665	165	OPM3290	169
FPT73PB	174	PF73FM (Pg 21)	133	BFP2256	131	CVX5489B	241	HOR3093	159	OKN3009	159
FPT74FM/MPX	181	PF73MPX (Pg 45)	136	BFP3280	169	CVX6489A	241	HRL4093	159	OL62	239
FPT74PB	174	PF73PB (Pg 21)	136	BP2094D	159	CXP3413	167	HRX4444	170	OL64	241
FPT75CXP	218	PF74FM (Pg 21)	133	BP3095	159	CXP3463	170	IDC3224	222	OLE4501	168
FPT75DLX/B	235	PF74MPX (Pg 45)	136	BUE4539	168	CXV3481	167	IFF2757	246	OLF4290	169
FPT75TPX/A	219	PF74PB (Pg 21)	136	BUF4280	169	CYP3015	159	IFX2462	248	OLFS290B	239
FTR73FM/MPX	181	PF75TPX/A	219	BUF5280B	239	DC61	242	IPP3732	171	OLF6290A	239
FTR73PB	174	PGP73FM/MPX	181	BUF6280A	239	DC62	239	IXP3445	167	OLL4026 (Pg 5)	159
FTR74FM/MPX	181	PGP73PB	174	BUL4095 (Pg 5)	159	DC64	241	IXP3445B	170	OLP4702	171
FTR74PB	174	PGP74FM/MPX	181	BUX4485	170	DC67	245	KGFA4231	172	OLX4483	170
FTR75CXP	218	PGP74PB	174	BUX4682	177	DD2555	171	KGL4087 (Pg 5)	159	OLX5483B	241
FTR75DLX/B	235	PGP75CXP	218	BUX5485B	241	DDF1492	131	KGX4418	174	OLX6483A	241
FTR75FDX	222	PGP75DLX/D	235	BUX6485A	241	DEP8112M	85	LMA4127	176	OMA3099A	159
FTR75FFX	223	PGP75MXD	216	BXP3485	167	DKP3077	159	LME4293	169	OML4099	159
FTR75QDX	226	PGP75QDX	226	BXP3671	165	DRP2346	176	LME4527	168	OMX5411B	241
FTR75TPX/A	219	PGP75TPX/A	219	CCP4732	167	ECF4259	172	LMF4293	169	OMX6411A	241
GMXCP	289	PO73FM/MPX	181	CCX4445	170	ECL4055 (Pg 45)	160	LML4028	159	OPF3702	171
HCV73PB	194	PO73PB	174	CEE4529	168	ECN3055	159	LMW4737	170	OPFA4271	172
HCV74PB	194	PO74FM/MPX	181	CEF4279	169	EMS2121	119	LMX4487	171	OPLA009 (Pg 5)	159
HO73FM (Pg 5)	137	PO74PB	174	CEFS279B	239	EMX6810	89	MCD3046	169	OPX4438	170
HO73MPX	177	PO75CXP	218	CEFG6279A	239	ESS8528	95	MCM4816 (Pg 5)	163	OPX4472	170
HO73PB (Pg 5)	138	PO75DLX/D	235	CEP3509	168	EXP8012	121	MDD2560C	242	OXAS3670	165
HO74FM (Pg 5)	137	PO75MXD	216	CEP3520	168	FBX4460	170	MDQ2520C	245	OXE3483	167
HO74MPX	177	PO75QDX	226	CEP4735	171	FBE3525	168	MED4051	159	OXE3632	165
HO74PB (Pg 5)	138	PO75TPX/A	219	CEV3524	168	FE03536	168	MEF4283	169	PC3030A	159
HO75TPX/A	219	PVN73FM (Pg 21)	133	CXA4471	170	FEP3503	168	MEF5283B	239	PB03519	168
ID200	202	PVN73MPX (Pg 45)	136	CXE5471B	241	FEP3514	168	MEF6283A	239	PFM1434	131
ID300	209	PVM73PB (Pg 21)	136	CXE6471A	241	FFB1470	131	MEM4816 (Pg 5)	163	PFM2208	131
IC300A	282	PVN74FM (Pg 21)	133	CFC2260AC	131	FFB2213	131	MEP4716	171	PFM3295	169
ID400 (Pg 5)	182	PVN74MPX (Pg 45)	136	CFE6745A	119	FMI632	131	MES1454	179	PTE4519	168
ID400A	273	PVN74PB (Pg 21)	136	CFE8001	91	FFM2231	131	MEX4977	170	PIF4286 (Pg 21)	169
ID400B	284	QD1000	226	CFE3298	169	FMS3288	169	MEX5497B	241	PIF5286B	239
ID500A,B	269	TML000	273	CFI3245	172	FK62	239	MEX6497A	241	PIF6286A	239
ID500C	288	TM2000	219	CFM1687	131	FK64	241	MFD3281	169	PIL4050	159
ID600 (Pg 5)	187	TM2500	219	CFM2200	131	FKF4285	169	MFM1858	131	PIM4820 (Pg 5)	163
ID650	287	TM3000,TPXB	279	CFM3299	169	FKF5285B	239	MFM2239	131	PIP4470	173
ID700	289	TO71MPX	156	CFV1701	131	FKF6285A	239	MFM3283	169	PIX4925	170
KM560A	273	TO73MPX	190	CFV2202	131	FKL4053	159	MFP3804	163	PIX5495B	241
KM561A	269	TO73PB	194	CFV2202AC	131	FKX4499	170	MFV2240	131	PIX6495A	241
LC075CXP	218	TO74MPX	210	CFV3298	169	FKX5499B	241	MFV3284	169	PNF1898	131
LC075DLX/B	235	TO75FM	211	CH62	239	FKX6499A	241	MIN9945	121	PNF2235	131
LC075FDX	222	TPB4000	280	CH64	241	FM7880	86	MMD3832B	163	PNF3358	175
LC075FFX	223	VA73FM (Pg 21)	133	CHA4109	176	FMS354	175	MMT3816	163	PNO3050	159
LC075QDX	226	VA73MPX (Pg 45)	136	CHF4299	169	F061	242	MMV3822B	163	PO62	239
LJV73FM (Pg 5)	137	VA73PB (Pg 21)	136	CHF5299B	239	F062	239	MNE6725A	123	PO64	241
LJV73MPX	177	VA74FM (Pg 21)	133	CHF6230-1	239	F064	241	MNI1410	123	POE4507	168
LJV73PB (Pg 5)	138	VA74MPX (Pg 45)	136	CHF6299A	239	F067	245	MPO3820	163	POF4295	169
LJV74FM (Pg 5)	137	VA74PB (Pg 21)	136	CHL4002	159	FOE4503	168	MPO3820B	163	POF5295B	239
LJV74MPX	177	VE73FM/MPX	181	CHP4710	171	F0F4288	169	MPT3716	171	POF6295A	239
LJV74PB (Pg 5)	138	VE73PB	174	CHX4463	177	FOF5288A	239	MT3051	159	POL4030	159
MAT73FM (Pg 21)	133	VE74FM/MPX	181	CHX4635	170	FOF5288B	239	MTR3824	163	POP4708	171
MAT73MPX (Pg 45)	136	VE74PB	174	CHX5463B	241	FOL4042	241	MU61	242	POX4455	170
MAT74FM (Pg 21)	133	VE75CXP	218	CHX6463A	241	FOM4804 (Pg 5)	163	MUG4	241	POX4645	177
MAT74MPX (Pg 45)	136	VE75DLX/D	235	CKE4533	168	FOP4704	171	MUE4547	168	POX5455B	241
MAT75CXP	218	VE75MXD	216	CKF4296	169	FOX4451	170	MUF4281	169	POX6455A	241
MAT75DLX/B	235	VE75TPX/A	219	CKF5296B	239	FOX4655	177	MUF5281B	239	PCC3708	171
MAT75QDX	226	VV71FM (Pg 5)	137	CKP6296A	239	FOX5451B	241	MUF6281B	239	PP2500	171
MAT75TPX/A	219	VV71PB (Pg 5)	93	CKL4019	159	FOX6451A	241	MUL4046	159	PPX2389	127
MCB2000	238	VW74FM	193	CKP4741	171	FP3042	159	MUM4832 (Pg 5)	163	PXC3455	167
ME73FM/MPX	181	VWB71FM (Pg 5)	137	CKX4489	170	FPE3726	171	MUX4453	170	PXC3455B	170
ME73PB	174	VWB71PB (Pg 5)	93	CKX5489B	241	FPM1468	131	MUX5453B	241	PXN3638	165
ME74FM/MPX	181	VWF71FM (Pg 5)	137	CKX6489A	241	FPM2217	131	MUX6453A	241	QME2445A	153
ME74PB	174	VWF71PB (Pg 5)	93	CLJ2098	159	FPM3298	169	MV62	239	Ra1ly 500	229
OL73FM/MPX	181	VWSB74FM	193	CMC3006A	159	FP03024	159	MV64	241	RRX4444	76
OL73PB	174	6MCXP	272	CNV3022	159	FP3707A	171	MVE4521	168	RT7284A	170
OL74FM/MPX	181	7670-MPX1	290	CP3002A	159	F0X3479	167	MVF4284	169	RVB6782	71
OL74PB	174	77CXP/78CXP	272	CPE3714	171	FXP3451	167	MVF5284B	239	SC6804	77
OL75CXP	218	77-200IA	281	CPE4542	168	FXP3451B	170	MVF6284A	239	SEA6801	72
OL75DLX/B	235	77-300IA	282	CPF4257	172	FXP3644	165	MVL4058	159	SED9060	99
OL75M4X	216	77/78-CPX	289	CPL4006	161	FXT3611	177	MVM4822 (Pg 5)	163	SEK3529	168
OL75QDX	226	136-1002	181	CPL4006T (Pg 45)	160	GAP5267B	239	MXV4493	170	SEK3540	168
OL75TPX/A	219	136-1003	181	CPP3710	171	GAP6267A	239	MXV5493B	241	SEL9506	74
OLF73FM/MPX	181	136-1006A	214	CPV3013	159	GAP3031	159	MXV6493A	241	SFB6802	79
OLF73PB	174	136-1007A	214	CPX4440	174	GAP3031A	159	MXD3453	167	SFK2258	131
OLF74FM/MPX	181	136-1012	222	CRS9440	103	GAX5452B	241	MXR8404	125	SFK3279	169
OLF74PB	174	136-1013	206	CSA4125	176	GAX6452A	241	MXT3479	167	SK3097	159
OLF75CXP	218	136-1016	223	CSA9934	103	GES6394PAK/T	71	MXT3479B	170	SPA5000B	141
OLF75DLX/B	235										

AUTOMATIC (CONT.)	VOL.	AUTOMATIC (CONT.)	VOL.	BOMAN (CONT.)	VOL.	CHANNEL MASTER	VOL.	CHRYSLER (CONT.)	VOL.	CHRYSLER (CONT.)	VOL.
SPK3735	171	VXA3457	167	293-8M	260	AC6826	239	1CH3507	195	2884750 (OBVD)	94
SPX-2369	252	VXA3626	165	294-8PB	261	AE6801	237	1CH3513	214	2884750 (1PD1211,	
SSS2595	143	WP2289A (Pg 5)	159	300PB	118	AE6802	236	1CH4007	90	2PD1211)	128
SST1179	145	XEM1156 (Series M)	149	305PB	142	AE6810	241	1CH4220	155	2884752 (OBCC)	94
SXK3471	167	XME1443	149	350FM	144	AE6811	243	1CH4307 (Pg 23)	155	2884752 (CF75203)	88
SXK3673	165	XPA2575A (Pg 15)	165	360PB	276	6203	116	1CH4402	180	2884753	84
TCP3028	159	XTP3487	167	400FM	112	6204	113	1CH4405	181	2884754	83
TCS3049A	159	XTP3487B	170	402FM	222	6275	223	1CH4507	195	2884755 (CF75503)	87
TCX3019	159	5400B	241	405FM (Pg 5)	144	6282	122	1CH4508	192	2884755 (2PF1007)	79
TDC2211	131	6100	242	460FM	277	6283	126	1CL2206	133	2884756 (2DP1006)	84
TD04730	171	6400	241	600MPX	113	6284	129	1CL2311	153	2884756 (CF75603)	88
TDF4278 (Pg 21)	169	6700	245	602MPX	163	6285	125	1DC2002	84	2884757	93
TDF5278B	239			605MPX	188	6286	124	1DP2010	109	2884758	81
TDF6278A	239	AUTO-SOHIC		642MPX	163	6287	151	1DT1214	135	2884759 (OBBJ,	
TD02254	131			650MPX	224	6288	154	1DT1215	137	1BBJ)	89
TD44477	170	ST48	91	660MPX	277	6289	183	1DT1244	135	2884759 (2PD1212)	128
TD5477B	241	ST88 (Mark 88)	95	200MPX	179	6291	121	1DT1316	153	2884759 (2PD1315)	157
TDX6477A	241	ST120G (LP)	99			6292	119	1DT1317	154	2884795	92
TER3523	164			BRITISH LEYLAND		6294	158	1DT1336	153	2884844	87
TER3523	168	BENDIX		F85MXR	122	6295	152	1DT1919	87	2884847	77
TFC1489	131			F95MB	122	6296	156	1DT2214	133	2884874	79
TFC3293	169	R2BG (Pg 113)	102	HAC725	122	6297	157	1DT2314	159	2884875	79
TFK3285	169	R2BT (Pg 113)	102	HAC731	128	6298	226	1PD1207	131	2884876	77
TFK4285	169	R2BV (Pg 113)	102	NIV1017	216	6299	227	1PD1208	131	2958277	89
TF03278	169	2B100AM, 2B101AM	131	NIV1018	216	6317	103	1PD1209	128	3420560	108
TFX3207	169	2B200FM, 2B201FM	133	NIV1021	216	6318	142	1PD1211	128	3420826	87
TFX3285	169	2B300MPX, 2B301MPX	133	OBTR, OBTRA	110	6348	229	1PD1313	156	3420888	81
TFX3296	169	3B200FM, 3B201FM	133	OBTRB	110	6376	189	1PD1506	196	3420889	109
TP3053	159	3B300MPX, 3B301MPX	133	R100	122	6378	188	1PD2207	135	3489157	96
TLU1590	74			1BM1441	216	6379	187	1PD2208	135	3489650 (1DT1214),	
TMA1550PA	160	BLAUPUNKT		1BM1442	216	6382	223	1PD2209	133	1DT1244)	135
TMA1550T	160			1BM1443	216	6383	185	1PD2307	156	3501013 (1BCC)	89
TOR3044	159	CR4090	254	1BM1443	216	6385A	224	1PD2308	159	3501013 (1PD1209,	
TPO3730	171	FRANKFORT-STEREO		1BM2132	128			1PD2309	152	2DP1209)	128
TPP3737	130	US	255	2BAMBL	130	CHEVELLE		1PD2312	152	3501013 (GG01303)	104
TPR3724	171	7636421	255	2BM1441	216	(See General Motors)		1PD2312	152	3501013 (Pg 73)	122
TR7292	81			2BM1442	216			1PD2349	158	3501013 (2PD1308)	157
TRE3534	168	BOMAN		2BM1443	216	CHEVROLET		1PD2509	194	3501013 (2PD1308)	157
TRE4523	168			2FBPM	129	(See General Motors)		1PF1206	131	3501013	179
TRF1490	131	AP15	189	2FBPMJ	129			1PF1312	156	3501014	105
TRF2233	131	Apollo XV	189	5BM1441	216	CHRYSLER		1PF2009	81	3501014	105
TRF3287	169	BMS66S	200	5BM1442	216	ARI730CE	266	1PF2205	135	3501014	105
TRF3356	175	BMS90	225	5BM1443	216	ARI730CR	278	1PF2310	152	3501059	105
TRF4287	169	BMS95	228			ARI730CR-B	266	1PF2347	158	3501156 (CC15603)	104
TRF5287B	239	BMS99	116	BRITISH MOTORS CORP.		ARI770CE	267	2CH1005	81	3501156	122
TRF6287A	239	BM900VW	228	HAC720	108	AR3100CR	272	2CH1210	136	3501156 (2PF1203)	128
TRL4045	159	BM909	119	8SMB	108	AR3100CR	272	2CH1401	179	3501156 (2PF1324)	157
TRM4824 (Pg 5)	163	BM909C	279			AR3100CR, CR-B	265	2CH1605	223	3501157	109
TRP4724	171	BM910	111	BUICK		AR3200SE	281	2CH2402	180	3501163 (1CH1210,	
TRX4491	170	BM911	141	(See General Motors)		AR3250SE	265	2CH2602	228	2CH1210)	136
TRX4647	177	BM921 (Pg 73)	153	CADILLAC		AR5705CR	268	2DC1011	83	3501163 (1CH1314)	157
TRX5491B	241	BM926	119	(See General Motors)		AR5705CRB	268	2DP1209	128	3501164 (18BFW1)	98
TRX6491A	241	BM950	146			AR6155GBL	117	2DT1316	153	3501164 (28BFW1)	109
TRX3449, TXC3489	167	BM960	121	CALTRON		AR6155GL	117	2PD1006	84	3501164 (38BFW1/	
TXC3650	165	BM1000	117	(See Cartape)		ARA10L	117	2PD1209	128	7313966)	147
TXO3477, TXO3479	167	BM1100	130	CARTAPE		ARA10W	117	2PD1211	128	3501165	108
TXP3491B	170	BM1110	165	CT3604	195	CC15603	104	2PD1212	128	3501166	104
TXP3499	167	BM1120	232	CT3700	147	CF09503	87	2PD1306	157	3501167	106
TXR3491	167	BM1123	212	CT3822	196	CF10103	88	2PD1308	157	3501231	179
TXR3636	165	BM1125	205	CT3882M	196	CF10503	93	2PD1315	157	3501232/33/34/35	181
UAF3310	269	BM1129	257	CT3900	148	CF15703	96	2PD1506	196	3501237	176
UAF6270	94	BM1130	166	CT4300	168	CF54403	86	2PD2313	159	3501238	176
UAF6270H	269	BM1145	257	CT4350 (Pg 39)	168	CF61003	88	2PD2509	194	3501239 (1CH12402,	
UAF6270L	226	BM1150	156	CT4355	237	CF65803	85	2PF1007	79	2CH2402, 5CH2402)	180
UP2064P (Pg 5)	159	BM1150B	230	CT4400	197	CF74803	90	2PF1203	128	3501240 (1CH12401,	
UP2064T (Pg 45)	160	BM1280	283	CT4800	119	CF74903	88	2PF1324	157	5CH2401)	181
UPB3200	270	BM1330	168	CT8900	116	CF75203	89	5CH1401	179	3501240 (1CH13507,	
UPX2354F	225	BM1330B	256	CT8999	123	CF75503	87	5CH1605	223	5CH3507)	195
UPX2354T	271	BM1330E	268	CT8999	123	CF75603	88	5CH2401	181	3501240 (1CH3513)	214
UPX3327	277	BM1335 (EP)	187	CT9300	148	CF75703	93	5CH2402	228	3501328 (1CH4405,	
VAL4088	159	(IC Version)	187	CT9300	148	CF79503	97	5CH2602	228	5CH4405)	181
VAX4443	170	BM1335 (LP)	196	CT9300	148	CF84403	82	5CH3507	195	3501328 (1CH4507,	
VBF4229	172	BM1339	259	CT8030A	189	CF84503	97	5CH4402	180	5CH4507)	195
VBL4088 (Pg 5)	159	BM1900	126	CT8104A	191	CG01303	104	5CH4405	181	3501329 (1CH4402,	
VBX4416	174	BM2900	120	CT8300P	177	CG10403	105	5CH4507	195	5CH4402)	180
VEE4505	168	Century 20	185	CT8359	173	CG15703	105	5CH4508	192	3501329 (1CH4508,	
VEF4297	169	Century 21	186	CT8500-4	132	CG16603	104	5PD1506	196	5CH4508)	192
VEF5297B	239	CR500	109	CT8800	123	CG16703	106	5PD2509	194	3501376	189
VEF6297A	239	CR520	122	CT8900	116	CG64803	93	18BFW1	98	3501457	253
VEL4004 (Pg 5)	159	CR800	109	CT8999	123	CG82704	89	18BFW2 (Pg 27)	98	3501458	251
VEP4706	171	CR820	124	CT9300	235	RS66SUB K	275	28BFW1	109	3501472	228
VEX4457	170	CT20	185	CT13882	157	RS67SUB K	270	39BFW1	147	3501501 (1PD2208)	135
VEX457B	241	CT21	186	CT18102	143	OBBC	94	402	73	3501501 (1PD2312)	152
VEX6457A	241	CT2200	204	CT18202	146	OBCC	94	404	73	3501502 (1PF2205)	135
VFA1847	131	DP5000	176	CT18599	149	OBBJ	89	2824744	97	3501502 (1PF2309)	152
VFA2204	131	MPX80	185	CT18877	163	OBDS	92	2824858	97	3501503 (1PD2207)	135
VFA3297	169	SP88	143	CT18999A	152	OBDT	97	2824859	97	3501504 (1CL2206)	133
VFP3249	172	SP90	116	X8020	150	OBVD	94	2884095	88	3501504 (1CL2206)	135
VGA3004	159	SP91	169	X8030/A	189	1BBC	89	2884101	88	3501504 (1CL2206)	133
VOX4428	174	SP190	137	X8100	119	1BBJ	89	2884287	73	3501504 (1CL2206)	133
VP6228	74	Sport 88	143	513LSC	209	1BVD (Pg 45)	94	2884289	73	3501506 (1PD1207)	151
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3501622 (1PD1506, 2PD1506,5PD1506)	196	CONTINENTAL (See Ford)		S401	95	D2SA19A242AH (Pg 57)	135	D8AF19A171AA (Pg 37)	246	D32A18806	136
3501622 (2PD1306)	157			S808	79	D2TA19A241125	126	D8AF19A171AB (Pg 43)	251	D40A19A241AA	180
3501623 (1PD2307)	156	CORVETTE (See General Motors)		S848	91	D2TA18806	126	D8AF19A180AA (Pg 45)	274	D42A19A171AB	179
3501623 (1PD2509, 2PD2509,5PD2509)	194			FALCON (See Ford)		D2TJ18806	124	D8AF19A188AA (Pg 45)	248	D44A18806AA	178
3501625	159	CRAIG		FO-MO-CO (See Ford)		D2UA18806	126	D8AF19A241AA (Pg 75)	286	D50A19A168AA	199
3501633	158			FORD		D2UA18806	138	D8AF19A241AB (Pg 45)	228	D52A19A241	174
3501634	158	Code 01	194	C80A19A049	87	D2VA19A241	127	D8AF18806AA (Pg 75)	248	D74F-19A180BA (Pg 43)	251
3501635	158	S600	268	C80A19A049E	106	D2VA19A242AD	135	D8AF18806AB (Pg 45)	286	D77J-19A171AA (Pg 37)	246
3501638/1639 Pg 35)	181	S601	274	C8YV18805B5	71	D2ZA19A241	127	D8EF18806BB (Pg 45)	286	D77J-19A171AA (Pg 37)	246
3501640/1641 Pg 35)	181	S603,A	270	C8YV18805B5	71	D2ZA19A242AF (Pg 57)	135	D8AF19A188AA (Pg 45)	228	D77J-18806AA (Pg 75)	248
3501654/1655 Pg 35)	176	S606	282	C9AA19A127C	80	D2ZA18806	129	D8DF19A198A	284	D80F18806AA-BA	262
3535069 (1DT1215)	137	S608	288	C9AA19A241	83	D3AA19A241	155	D8DF19A242AB	275	D80F18806BB	283
3635149 (1DT2214)	133	S631	283	C9A19A241B	80	D3AA19A241	137	D8EF18814AC	263	D84F19A168AB	281
3635149 (1DT2314)	159	S680	289	C9MA19A241	78	D3DA18806	136	D8EF18814AA	285	D90F18806AA	288
3895716 (Pg 35)	181	S681	287	C9MA19A242C	88	D3SA19A241	137	D8EF19A171AA (Pg 37)	246	D94F19A168AA	281
3895717 (Pg 35)	176	S682	290	C9SA19A241	76	D3TA18806A	138	D8EF19A171AB (Pg 45)	277	D94F19A198BA	284
4048001	269	T600	267	C9SA19A241	71	D3TA18806B	138	D8EF19A241AA (Pg 45)	228	D5219A171BA	200
4048142	289	T603	273	C9VA19A241	71	D3VA19168AC	155	D8EF19A241AC	280	ED1D1GA19A241	97
4048362	290	T605	277	C9VA19A241	71	D3VA19A242AB	153	D8EF19A242AB	275	ED1D1GA19A241	94
4048364	285	T606	284	DOAA19A241	81	D3ZA18806	136	D8EF19A242AB	271	ED1D19A19A241	100
4048365	286	T611	278	DOAA19A243	80	D4AA19A168AA	183	D8HF18806CA (LP)	286	ED1D19A19A241	98
4048366	284	T632	285	DOAA18806	83	D4AA19A168BA	181	D8HF18806DA (LP,EA)	275	ED1D1TA19A241	98
4048370	298	T632	285	DOAA18806	83	D4AA19A241AA	174	D8HF18806DA (LP)	286	ED1D1WA19A241	97
7313966	147	T681	279	DOAA18806	83	D4AA18806AA	171	D8HF19A241BA	280	ED1D1Z19A241	98
RS67SUB K	270	T681	279	DOAA18806 (Pg 55)	81	D4BJ18810AA	172	D8HF19A241BB	280	EDD1GA19A241	97
		T681	279	DOAA18806 (Pg 55)	81	D4DJ19A171BA	178	D8HF19A241BB	280	EDD1GA19A241	98
		T681	279	DOAA18806 (Pg 55)	81	D4HA18806AA	170	D8HF19A242BA	275	EDD1SA19A241	100
		T681	279	DOAA18806 (Pg 55)	81	D4HA18810AA	172	D8HF18806CA, DA, EA	271	EDD1TA19A241	98
		T681	279	DOAA18806 (Pg 55)	81	D4HA18810BA	172	D8MF19A168AB	281	EDD1WA19A241	97
		T681	279	DOAA18806 (Pg 55)	81	D4OA19A241AA	180	D8MF19A180AB (Pg 43)	251	EDD1Z19A241	98
		T681	279	DOAA18806 (Pg 55)	81	D4TA19A241AA	174	D8MF19A188AA (Pg 45)	228	F8TBC	71
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8MF19A188AA (Pg 45)	228	T9MM	88
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8MF19A241AA	264	TF864AX	181
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8MF19A241AB	280	OBLS	82
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8MF19A241AB	280	OBM	77
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8TF18814AC	263	OBTF	83
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8TF18814AE	285	OBTM/TP/TPP	77
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8TF19A171AA (Pg 37)	246	OBTU	77
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8TF19A171AA (Pg 37)	246	OFBA	82
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8TF19A171AA (Late Version)	277	OFBD	75
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8TF19A171AA	272	OFBF (EP) (Pg 59)	73
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8TF19A171AA	272	OFBG	81
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8TF19A241AA	278	OFBL	75
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8TF19A241AA (Late)	268	OFBM	85
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8TF19A241AA	264	OFBO	79
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8TF19A241AA	264	OFBSW	96
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8TF18806BA (LB)	286	OFBX	81
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8TF18806BA	286	OFBZ	94
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8TF18806BA (Pg 75)	248	IBTF	115
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8UF18814AE	263	1CP1047	102
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8UF18814AE	285	1CP1323	153
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8VF19A171AA (Pg 37)	246	1CP2033	109
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8VF19A171AA (Late Version)	277	1CP2235	135
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8VF19A171AA	277	1CP2417	182
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8VF19A171AA	277	1CR4005	86
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8VF19A171AA	277	1F1RAM4	178
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8VF19A171AA	277	1F2RFM4	178
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8VF19A171AA	277	1F3RMM4	180
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8VF19A171AA	277	1F8A	98
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8VF19A171AA	277	1FBF	94
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8VF19A171AA	277	1FBG	94
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8VF19A171AA	277	1FBGG	97
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8VF19A171AA	277	1FBGX	97
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8VF19A171AA	277	1FBL	97
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8VF19A171AA	277	1FBM	98
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8VF19A171AA	277	1FBO	94
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8VF19A171AA	277	1FB00	98
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8VF19A171AA	277	1FB0X	98
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8VF19A171AA	277	1FB5X	100
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8VF19A171AA	277	1FBTP	94
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8VF19A171AA	277	1FBTTP	98
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8VF19A171AA	277	1FBTPX	98
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8VF19A171AA	277	1FBW	98
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8VF19A171AA	277	1FBWX	97
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8VF19A171AA	277	1FBW	97
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8VF19A171AA	277	1FBZ	94
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8VF19A171AA	277	1FBZX	98
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8VF19A171AA	277	1FBZ	98
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8VF19A171AA	277	1FD2507	200
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8VF19A171AA	277	1FD4103	104
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8VF19A171AA	277	1FD4217	135
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8VF19A171AA	277	1FD4302	155
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8VF19A171AA	277	1FD4505	222
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8VF19A171AA	277	1FD4510	199
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8VF19A171AA	277	1FD4511	222
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8VF19A171AA	277	1FD4602	228
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8VF19A171AA	277	1FD4607	223
		T681	279	DOAA18806 (Pg 55)	81	D4TA18806AA	171	D8VF19A1			

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1LN4213	135	01VFP3	92	12BFMT2	115	21VFM1 (Pg 25)	78	31APB2	145
1LN4306	155	01VMPA1/PH1	78	12BFP1	102	21VFP1	117	31APBK1	137
1LN4606	228	02AFM1	76	12BFP2 (Pg 101)	102	21VFP2/P3	127	31APBK2	145
1MA2119	108	02AFM2	89	12BFPK1	102	21VMPA1/H1 (Pg 39)	78	31BFM1 (PCB	
1MA2233	133	02AFM2	79	12BFPK2 (Pg 101)	102	21XFMT1 (7930121)	118	AR151)	140
1MT4002	92	02AFP1/PK1	94	12BPB2	105	21XFMT1 (7936191)	115	31BFMT1	151
1MY4006	85	02ABP1/BK1	101	12BPBK2	105	21XPBT1 (Chev.)	115	31BFMT2	142
1MY4106	105	02BPF1	76	12BPBT1	101	21XPBT1 (Pont.)	117	31BFP1/PK1	138
1MZ4004	86	02BPF2	89	12BPT2	117	22AFM1	113	31BPB1	137
1MZ4218	135	02BFP1/PK1	94	12BT411	97	22AFP1, 22AFP2	120	31BPB2	145
1MZ4304	153	02BPP1/BK1	75	12FPM1	106	22AFP3 (Pg 89)	120	31BPBK1	137
1PN2120	108	02BT411	80	12FFP1 (71 Pont.)	97	22AFPK1, 22AFPK2,		31BPBK2	145
1PN2216	133	02BT412	90	12FFP1 (72 Pont.)	120	22AFPK3	120	31BPBT1	139
1PN2318	178	02FFM1	79	12FFPK1 (71 Pont.)	97	22APB1	114	31FFMT1 (Pg 19)	75
1PN2411	179	02FFM2	76	12FFPK1 (72 Pont.)	120	22APB2	126	31FPBT1 (Pg 57)	74
1PN2513	200	02FFP1	94	12FPB1	98	22APBK1	114	31TPB1 (Pg 47)	124
1PN4605	223	02FFP2/PK2	94	12FPBK1	98	22APBK2	126	31TTCP1 (Pg 47)	124
1TB4008	84	02FPB1	101	12FT451	97	22AT411	112	31XFMT1 (Pg 29)	109
1TB4211	135	02FPB2/BK2	101	12GFM1	106	22BFM1/M2	112	31XFP1 (Pg 25)	127
2BL/LAF	126	02FT412	90	12GFP1 (71 Pont.)	97	22BFMT1	115	31XFPK1 (Pg 25)	127
2BTB	114	02GFM1	79	12GFP1 (72 Pont.)	120	22BFP1	109	31XPB1 (Pg 47)	124
2BTT	114	02GFM1/PK1	94	12GFPK1	120	22BFP2	109	31XPBK1 (Pg 47)	124
2CR7	105	02GPP1/BK1	75	12GPB1	98	22BFPK1	109	31YFM1 (Pg 25)	78
2CR4107	105	03AFM1	80	12GPBK1	98	22BFPK2 (Pg 99)	109	31YFP1 (Pg 25)	127
2FBF/BFAK	127	03AFM2	88	13AFM1	105	22BPB1	118	32AFM1	144
2FBL	127	03APB1	98	13AFB1	101	22BPB2	122	32AFM2	154
2FBO	127	03BPM1	80	13AT411	97	22BPB2A	138	32AFM3	154
2FBTB, 2FBTPAC	126	03BPM2	88	13BFM1	98	22BPBK1	118	32AFMT1	152
2FBZ	127	03BPM1	73	13BFM2	98	22BPBK2	115	32AFMT2	148
2FD3	104	03BT411	78	13BFMT1	97	22BPBK2A	138	32AFP1	137
2FD4103	104	03EFM1	80	13BFMT2	117	22BPK3	122	32AFP2	149
2FD4607	223	03EFM2	88	13BPB2	101	22BPBT1	117	32AFPK1	137
2FD4608	223	03EPB1	73	13BPBT1	96	22BPBT2	127	32AFPK2	149
2LN4110	102	03ET411	78	13BPBT2	118	22BT411	112	32APB1	140
2MR1	105	03ET412	87	14AFP1	101	22FFM1	113	32APB2	140
2MR4111	105	04AFP1	75	14APB1	106	22FFP1, 22FFP2	120	32APBK1	140
2MT4108	104	04AFP2	88	14AT411	97	22FFP3 (Pg 89)	120	32APBK2	145
2MY4106	105	04APB1	100	14BFM1	102	22FFPK1, 22FFPK2,		32APBT1	145
2MYR	105	04AT411	82	14BFM2 (Pg 5)	98	22FFPK3	120	32BFM1	144
2MZ4101	104	04AT412	81	14BFMT1	98	22FPB1	114	32BFMT1	152
2TB4109	102	04BFM1	83	14BFMT2	120	22FPB2	126	32BFMT2	148
5CP2417	182	04BFP1	75	14BFP1	96	22FPBK1	114	32BFP1, 32BFPK1	137
5F1RAM4	178	04BPM1	77	14BFP2 (Pg 11)	96	22FPBK2	126	32BPB1	140
5F2RFM4	178	04BPB2	73	14BPBT1	100	22FT451	112	32BPB2, 32BPBK1	140
5F3RMD4	180	04BPB4	77	14BPBT2	114	22GFM1	113	32BPBK2	138
5FD2507	200	04BT411	82	14BT41	97	22GFP1, 22GFP2,		32BPBT1	145
5FD4510	199	04BT412	81	14LPB2	96	22GFP3 (Pg 89)	120	32FFM1 (Pg 81)	113
5FD4706 (Pg 45)	228	04EFM1	83	14PFB1	97	22GFPK1, 22GFPK2,		32FFP1 (Pg 89)	120
5FD4802/3	275	04EFM2	88	15CFMT1, 15CFMT2,	96	22GFPK3	120	32FFPK1 (Pg 89)	120
5FD4804 (Pg 45)	228	04EFP1	77	15CFMT3	114	22GPB1	114	32FPB1 (Pg 107)	126
5DS4806	275	04EFP2	88	15CFP1	100	22GPB2	126	32FPBK1 (Pg 107)	120
5LN4707 (Pg 45)	228	04EPB1	77	15CFP2 (Pg 29)	100	22GPBK1	114	32GPB1	140
5LN4714 (Pg 45)	228	04EPB2	73	15CMW1	102	22GPBK2	126	32GPB2, 32GPBK1	140
5LN4805 (Pg 45)	228	04EPB4	77	15CMW2 (Pg 19)	102	22XT411	112	32GPBK2	138
5PN2318	178	04LPB1	100	15CT411	97	32AFM1	112	33AFM1 (PCB	
5PN2411	179	04PPB1	100	16TFP1	104	23AFP1	115	AR151)	139
5PN2508 (Pg 79)	179	05CFP1	76	16TRMP1	96	23AFP2/P3	128	33AFMT1	145
5PN2513	200	05CFP2	93	16TT411	97	23APB1	120	33AFMT2	144
6AD6DA19A171	226	05CFW1	79	16TTCP1	96	23APB2	128	33AFPBT1	146
6AD6DA18806AA	221	05CMW1/MW1	78	16UT411	97	23AT411	112	33APPBK2	146
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6GD2507	200	05CT412	94	21AFM1 (Chev.)	109	23BFMT1	117	33APB2	147
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564.626410 88	AT3700-1 271	CR755.T 214	DC4060 160	1VW4309 179	XA806 254
564.626420 93	AT7801-1 273	CR755.T 214	DC4060 160	1VW4412, 5VW4412 . 201	XA808 225
564.626430 92	AT7811-1 273	CR755.T 214	DC4060 160	1VW4419 191	XCB23A 249
564.626440 92	AT7822-1 274	CR755.T 214	DC4060 160	2BG 102	XCB28 242
564.626450 158	AT7823-1 274	CR755.T 214	DC4060 160	2BT 102	XCB88 246
564.626460 161	DP640-1/3 272	CR755.T 214	DC4060 160	2BV 102	
564.626470 162	GL7851-1 281	CR755.T 214	DC4060 160	2VW1003 80	
833.R6286 92	GP7881 282	CR755.T 214	DC4060 160	2VW1116 118	
833.50290 89		CR755.T 214	DC4060 160	2VW1327 155	
		CR755.T 214	DC4060 160	3VW1116 118	
		CR755.T 214	DC4060 160	5VW1327 155	



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