



AUTO RADIO SERVICE DATA



+AR-276+



Boman 360PB

Chrysler By Mitsubishi Plymouth Arrow AR-3250SE

Ford D9LF18B826AE J.I.L. 873

Panasonic CQ-3711EU, EC/3712EU, EC

Pioneer TP-7006, 9004/6 Sankyo SCS-444

Sanyo FT872



AUTO RADIO

SERVICE DATA

AR-276



HOWARD W. SAMS & CO., INC.

INDIANAPOLIS INDIANA

**FIRST EDITION
FIRST PRINTING-APRIL, 1979**



**AUTO
RADIO
SERVICE DATA
AR-276**

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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.

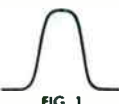
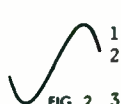
CARTRIDGES

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

Pages 5-11 Courtesy of BOMAN ASTROSONIX DIV. CALIF. AUTO RADIO INC.

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: 5000,8277,9089
 ALL Coils and Trimmers

PUSH-BUTTON ADJUSTMENT

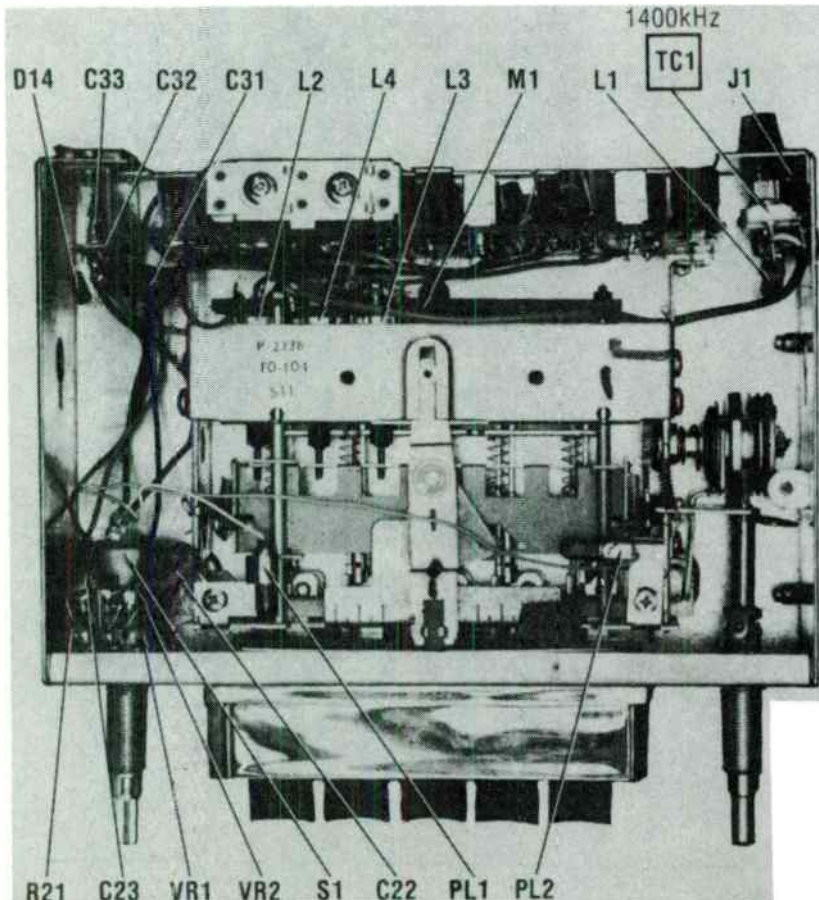
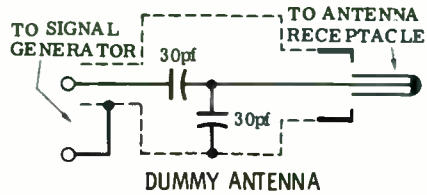
1. Pull button out.
2. Tune manually to desired station.
3. Press button in firmly.
4. Repeat for remaining buttons.

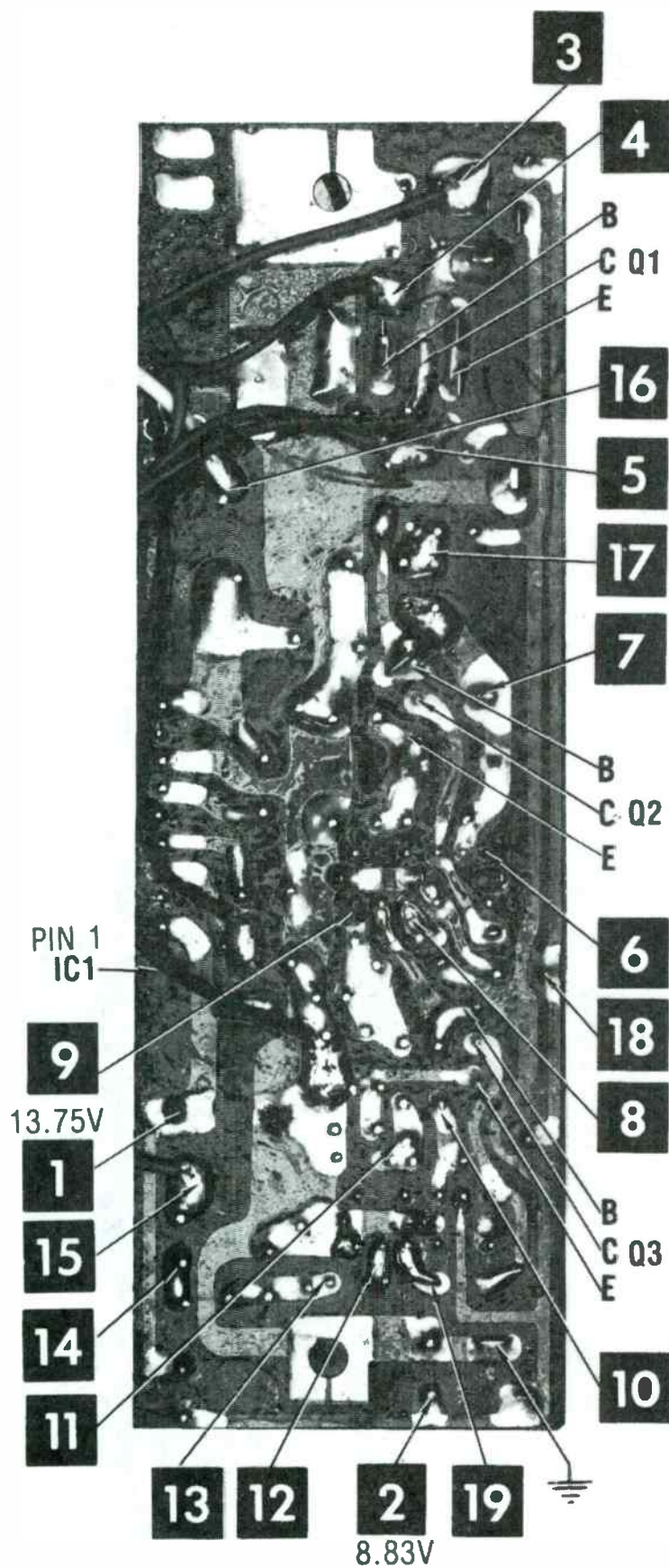
AM ALIGNMENT—SELECTOR IN AM POSITION

Connect output meter across speaker voice coil.

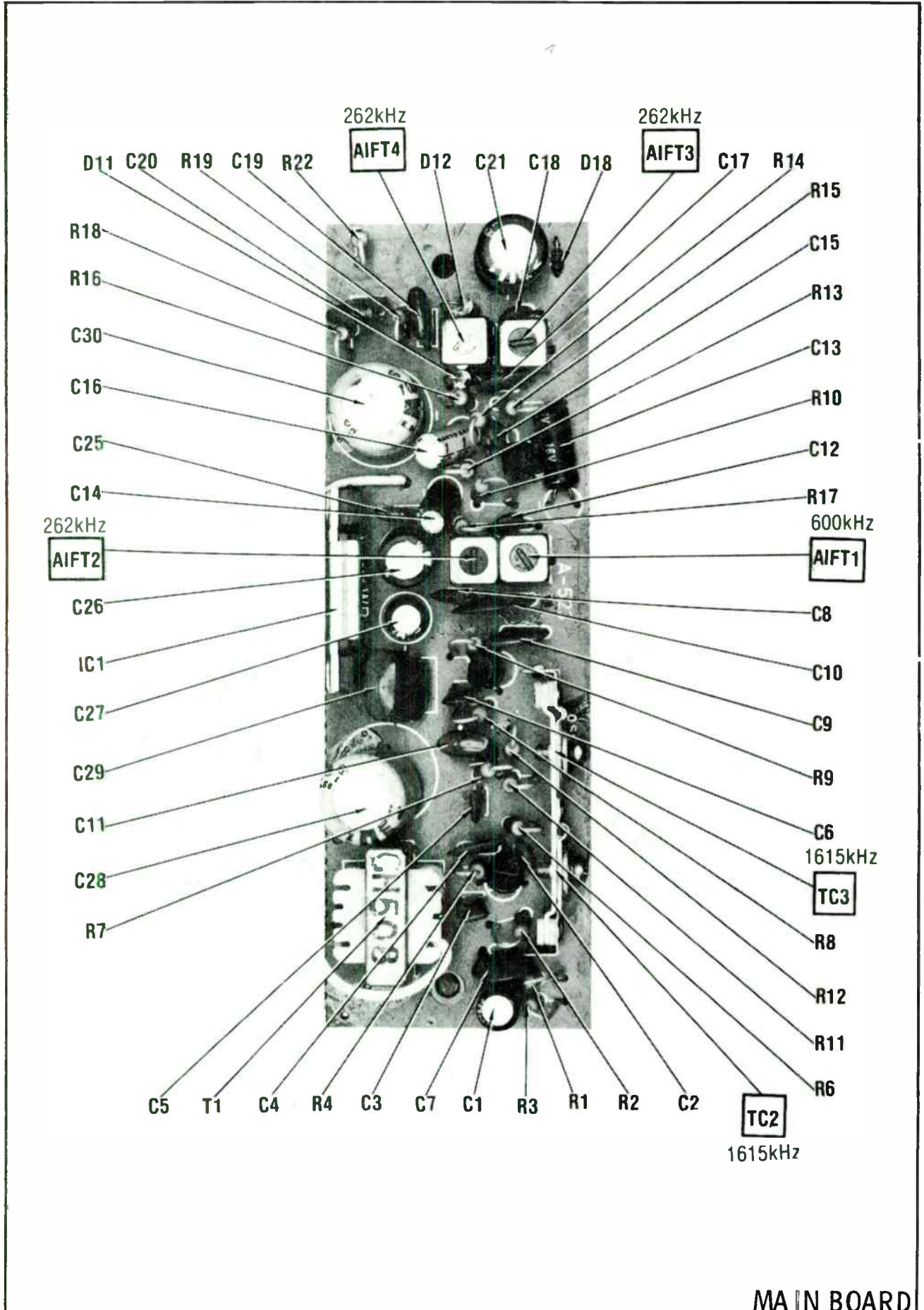
GENERATOR COUPLING	GENERATOR FREQUENCY	RADIO DIAL SETTING	ADJUST	REMARKS
High side thru .1uF to antenna.	262kHz 400-Hz mod.	High freq end stop	AIFT-4, AIFT-3, AIFT-2 AIFT-1	Adjust for maximum.
Thru dummy antenna to antenna input.	1615kHz 400-Hz mod.	1615kHz	TC3,TC2	Adjust for maximum.
Thru dummy antenna to antenna input.	1400kHz 400-Hz mod.	1400kHz	TC1	Adjust for maximum. Repeat alignment until no further improvement is noted.

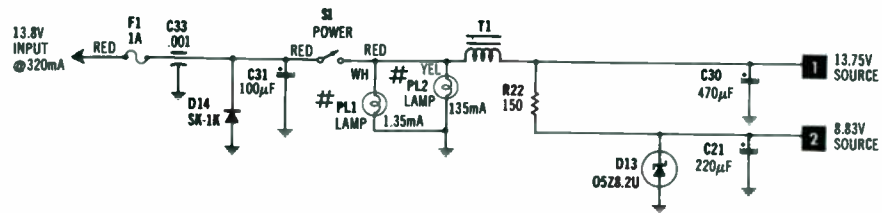
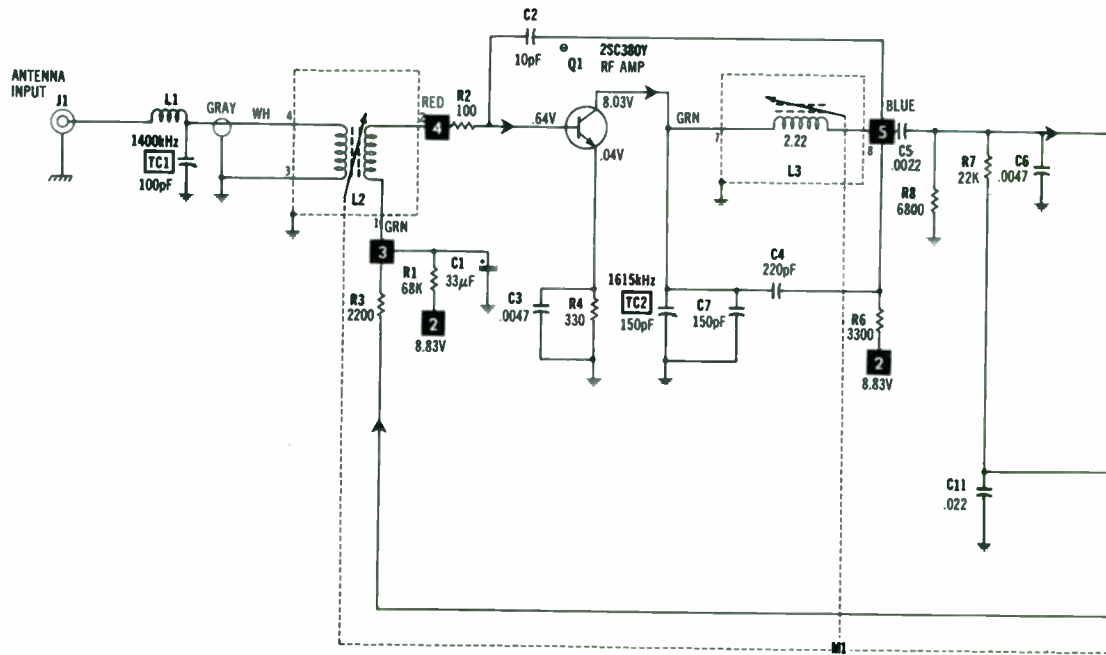
With radio installed in car and antenna extended 36", tune in a weak station near 1400kHz and adjust TC1 for maximum output. Antenna adjustment is located on rear of unit in top left corner.



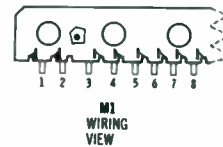


MAIN BOARD





Terminal Guides



- ✗ Circuitry not used in some versions
- Circuitry used in some versions
- ⊙ See ports list
- ⊛ Nominal value
- ⊕ Ground
- ⌈ Chassis
- ▽ Common tie point
- Signal path
- ↔ Voltage path

Measurements with switching as shown unless noted.

Item numbers in rectangles appear in the alignment/adjustment instructions.

Supply voltage maintained as shown at input.

Voltages measured with digital meter, no signal.

Controls adjusted for normal operation.

Arrow of control indicates direction of advance.

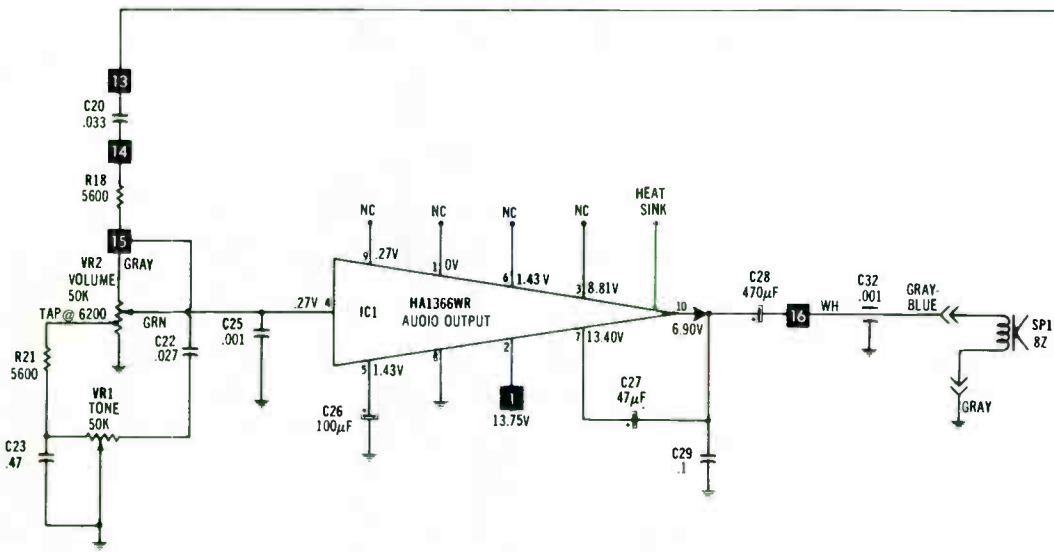
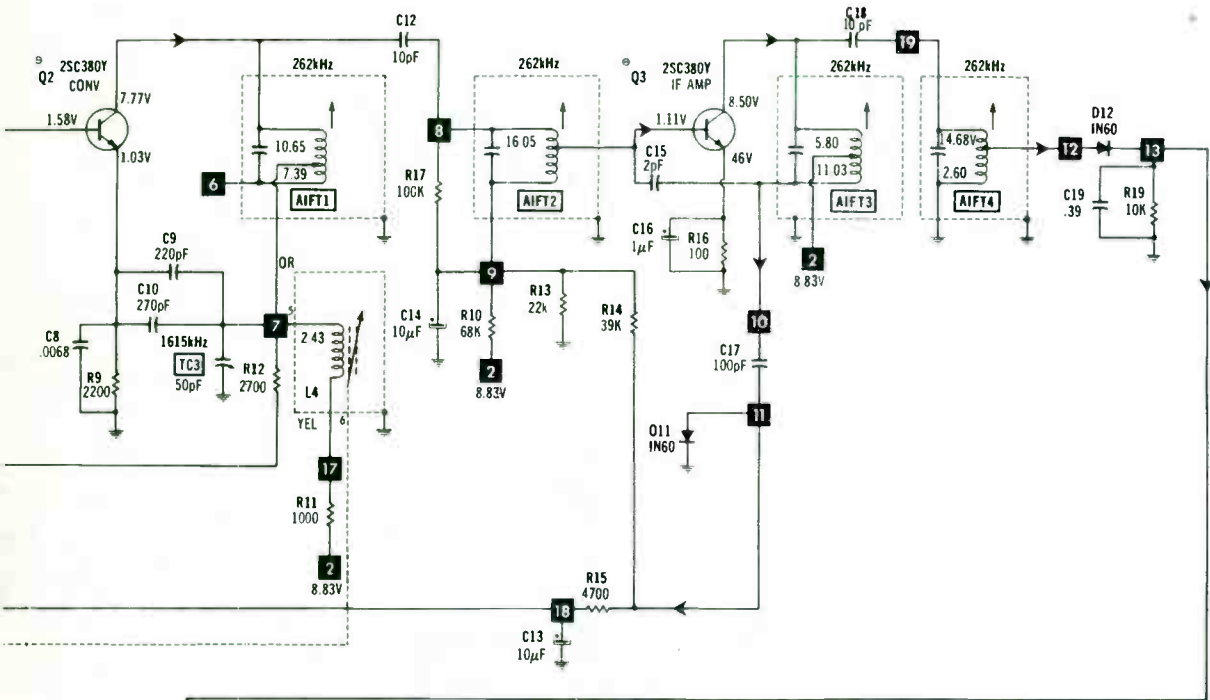
Terminal identification may not be found on unit.

Resistors are 1/2W or less, 5% unless noted.

Value in () used in some versions.

A PHOTOFACIT STANDARD NOTATION SCHEMATIC

WITH **CIRCUITRACE**



PARTS LIST AND DESCRIPTION

(When ordering parts, state Model, Part Number, and Description.)

WIRING DATA

General-use Hook-up Wire	Use BELOEN No. 8530 (Solid) Available in 12 Colors 8524 (Stranded) Available in 12 Colors
Shielded Antenna Lead	Use BELOEN No. 8240 (Solid) Miniature (RG-58/U) 8259 (Stranded) Miniature (RG-58A/U)
Shielded Cable	Use BELOEN No. 8499 Single-conductor Shielded (Neoprene)

SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	BOMAN PART No.	REPLACEMENT DATA									
			GENERAL ELECTRIC PART No.	MALLORY PART No.	MOTOROLA PART No.	RAYTHEON PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.	THORDARSON PART No.	WORKMAN PART No.	ZENITH PART No.
D11	1N60	103-006	1N60	PTC206	HEPR9135	REN 109	SK3088	RT-263	ECG109	TM105/**	WEP134	103-29001
O12	1N60	103-006	1N60	PTC206	HEPR9135	REN 109	SK3088	RT-263	ECG109	TM109/**	WEP134	103-29001
O13	0528.2U	103-177	GEZD-8.2	ZB8.2B	HEPR9135	REN 5072	SK3136	RT-257	ECG5072A	TM5072/**	WEP110B	
O14	SR-1K	103-088	GE-504A	PTC201	HEPR0052	REN 116	SK3311	RT-213	ECG116	TM116	WEP156	212-76-02
IC1	HAI366WR	101-121							ECG1261			
Q1	2SC380Y	102-056	GE-61*	PTC136*	HEPS0016*	REN 107	SK3018*	RT-107A	ECG107	TM107	WEP380	121-29001*
Q2	2SC380Y	102-056	GE-61*	PTC136*	HEPS0016*	REN 107	SK3018*	RT-107A	ECG107	TM107	WEP380	121-29001*
Q3	2SC380Y	102-056	GE-61*	PTC136*	HEPS0016*	REN 107	SK3018*	RT-107A	ECG107	TM107	WEP380	121-29001*

* Lead configuration may vary from original.
/** Also available as exact type replacement.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	REPLACEMENT DATA				
		BOMAN PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
					Q-LINE	GENERAL LINE
C1	33 10V		PC30-25	VTT33810	QV1-61	EV-1125
C13	10 16V		PC10-25	VTT10B25	QV1-41	EV-1222
C14	10 16V		PC10-25	VTT10B25	QV1-41	EV-1222
C16	1 10V		PC1-50	VTT1A50	QV1-9	EV-1315
C21	220 10V		PC250-10	VTT220F10	QV1-115	EV-1140
C26	100 10V		PC100-10	VTT100E10	QV1-93	EV-1130
C27	47 10V		PC50-16	VTT47016	QV1-73	EV-1226
C28	470 16V		PC500-16	VTT470K16	QV1-151	EV-1250
C30	470 16V		PC500-16	VTT470K16	QV1-151	EV-1250
C31	100 16V		PC100-16	VTT100F16	QV1-95	EV-1230

CAPACITORS

ITEM No.	RATING	BOMAN PART No.	REPLACEMENT DATA				
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
						Q-LINE	GENERAL LINE
C2	10			GP10	GP410	QC2-9	5GA-Q10
C3	.0047 50V 10%			WMF1D47	M194P4729R8	QFT2-63	1FT-D47
C4	220		0D-221		GP322		10TS-T22
C5	.0022 50V 10%			DPMS6U22	M192P2229R8	QFT2-27	1FT-022
C6	.0047 50V 10%			WMF1D47	M192P4729R8	QFT2-63	1FT-D47
C7	150		0D-151		GP315		10TS-T15
C8	.0068 50V 10%			WMF1D68	EFW1A268	QFT2-73	1FT-D68
C9	220		DD-221		GP322		10TS-T22
C10	270		DD-271		GP327		10TS-T27
C11	.022 50V 10%			GP270	M192P2239R8	QFT2-127	1FT-S22
C12	10			DPMS2S22	GP410	QC2-9	5GA-Q10
C15	2			GP10	GP533	QC2-1	5GA-V50
C17	100		DD-101		GP310		10TS-T10
C18	10			GP10	GP410	QC2-9	5GA-Q10
C19	.039 50V 10%			DPMS6S39	M192P3939R8	QFT2-159	1FT-S39
C20	.033 50V 10%			OPMS6S33	M192P3339R8	QFT2-149	1FT-S33
C22	.027 50V 10%			DPMS6S27	M192P2739R8	QFT2-139	1FT-S27
C23	.047 50V 10%			DPMS2S47	EFW1A147	QFT2-171	1FT-S47
C25	.001 50V 10%			DPMS6D1	EFW1A210	QFT2-1	1FT-Q10
C29	.1 50V 10%			WMF05P1	EFW05010	QFT2-215	1FT-P10
C32	1000						
C33	1000						
TC1	100						
TC2	150 1615kHz						
TC3	50 1615kHz						

CONTROLS (All wattages 1/2 watt, or less, unless listed)

ITEM No.	FUNCTION	RESISTANCE	REPLACEMENT DATA			
			BOMAN PART No.	CENTRALAB PART No.	MALLORY PART No.	TRW PART No.
VR1	Tone	50K	138-181			
VR2	Volume/Power Switch	50K Tap @ 6200	138-181			

PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		BOMAN PART No.	OTHER IDENTIFICATION	MILLER PART No.	
AIFT1	Converter (600kHz)	131-622	8150	2067	(1) Part of M1.
AIFT2	IF (262kHz)	131-623	8511		
AIFT3	IF (262kHz)	131-624	8512		
AIFT4	IF (262kHz)	131-625	8513		
L1	RF Choke (5.6uH)				
L2	Antenna Matching	(1)			
L3	RF Amp	(1)			
L4	Oscillator	(1)			

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000~)	MFR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T1	.32A	.18	.65mH	124-049 CH-508(1)			(1) Number on unit.

FUSE DEVICES

ITEM No.	DESCRIPTION	REPLACEMENT DATA						
		BOMAN PART No.		BUSS PART No.		LITTELFUSE PART No.		WORKMAN PART No.
		DEVICE	HOLDER	DEVICE	HOLDER	DEVICE	HOLDER	DEVICE
F1	1A Quick Acting			AGC1	HRK	312001	150145	FG1-2

MISCELLANEOUS

ITEM No.	PART NAME	BOMAN PART No.	NOTES
J1	Jack		Antenna Assembly (13.80V DC @ 135mA) (13.80V DC @ 135mA) Power On/Off Radio Tuning (Complete with front shaft, universal rear shaft, tuning gear, and retaining spring)
M1	Tuner		
PL1	Lamp	267-007	
PL2	Lamp	267-007	
S1	Switch	138-181	
	Tuning Shaft	157-027	

For SAFETY use only equivalent replacement part.

CABINETS & CABINET PARTS (When ordering specify model, chassis & color)

ITEM	PART No.	ITEM	PART No.
Case, Bottom	198-204	Knob, Tone	191-320
Case, Top		Knob, On/Off, Volume	191-321
Chassis		Knob, Tuning	191-320
Escutcheon		Pushbutton (5 Used)	191-336

ALIGNMENT PROCEDURES

In case of readjustment, the test oscillator, vacuum tube voltmeter or tester should be available for carrying out adjustment according to the table of the sequence of adjustment.

- **Measurement of output voltage**
 Measure the voltage at both ends of the voice coil of the speaker by using the vacuum tube voltmeter (or AC range of tester).
- **Test oscillator and its connection**
 The test oscillator should be used at 400 Hz or

1000 Hz with 30~40% modulation. Connect the oscillator to VC1 or the antenna receptacle in series with a capacitor or dummy antenna, with the cold side, to the metal chassis, as shown in the ALIGNMENT PROCEDURE CHART.

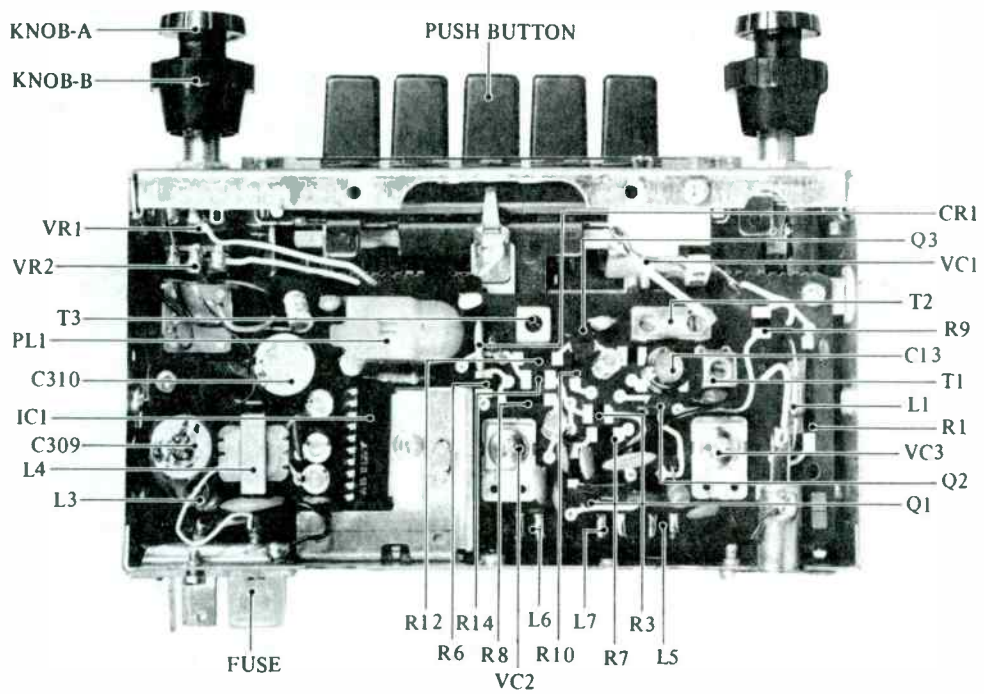
- **Procedure of adjustment**
 For tuning the screw core of the oscillator coil, etc., use of a driver made of bakelite stick is recommended for avoiding aberration due to adjusting.

List of Alignment Procedures

Proce- dures	Circuit	Signal generator coupling	Signal generator frequency	Radio dial setting	Indicator	Adjust	Remarks	
1	IF circuit	Hot side to the VC1 terminal through 1~3pF Cold side to chassis	455 KHz	Point of non interference near 1600 KHz	Output meter across voice coil	T2 (RED)	Try to equalize the degree of decrease near ±10 KHz	
2						T3 (BLU)		
3	Oscillation and RF circuit	Through dummy (Fig. 3) to antenna receptacle	515±5 KHz	Lower freq. stop end	"	T1		
4			1650±10 KHz	Higher freq. stop end	"	VC3		
5							Repeat procedures 3~4	
6			1400 KHz	1400 KHz	"	VC1 VC2	Adjust VC1, VC2, and get the maximum vol- tage output.	
7			600 KHz	600 KHz	"	T1	Turn T1 gradually and find the maximum sensi- tivity near 600 KHz.	
8			1400 KHz	1400 KHz	"	VC3	When the receiving frequency has changed because of adjusting 8 adjust VC3 to correct.	
9						"	Repeat procedures 6~8	Check the range of the frequency of the re- ceived wave. This is the end of the adjustment.

When you have installed the set in the car raise the antenna at its maximum length, receive a weak station near 1400 KHz, and adjust antenna trimmer VC₁ in order to get the maximum output.

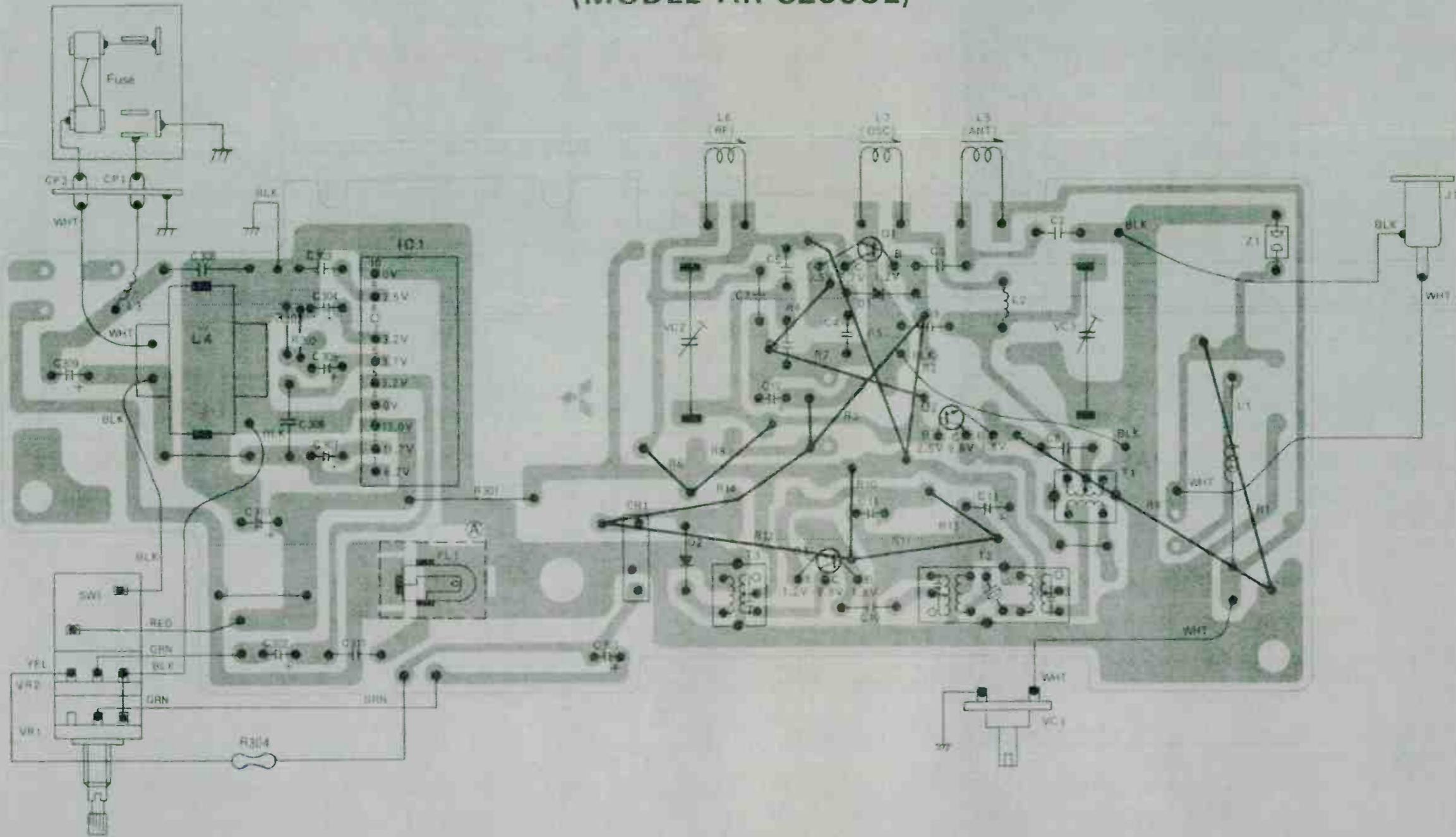
8. PARTS DISPOSITION



View of Chassis

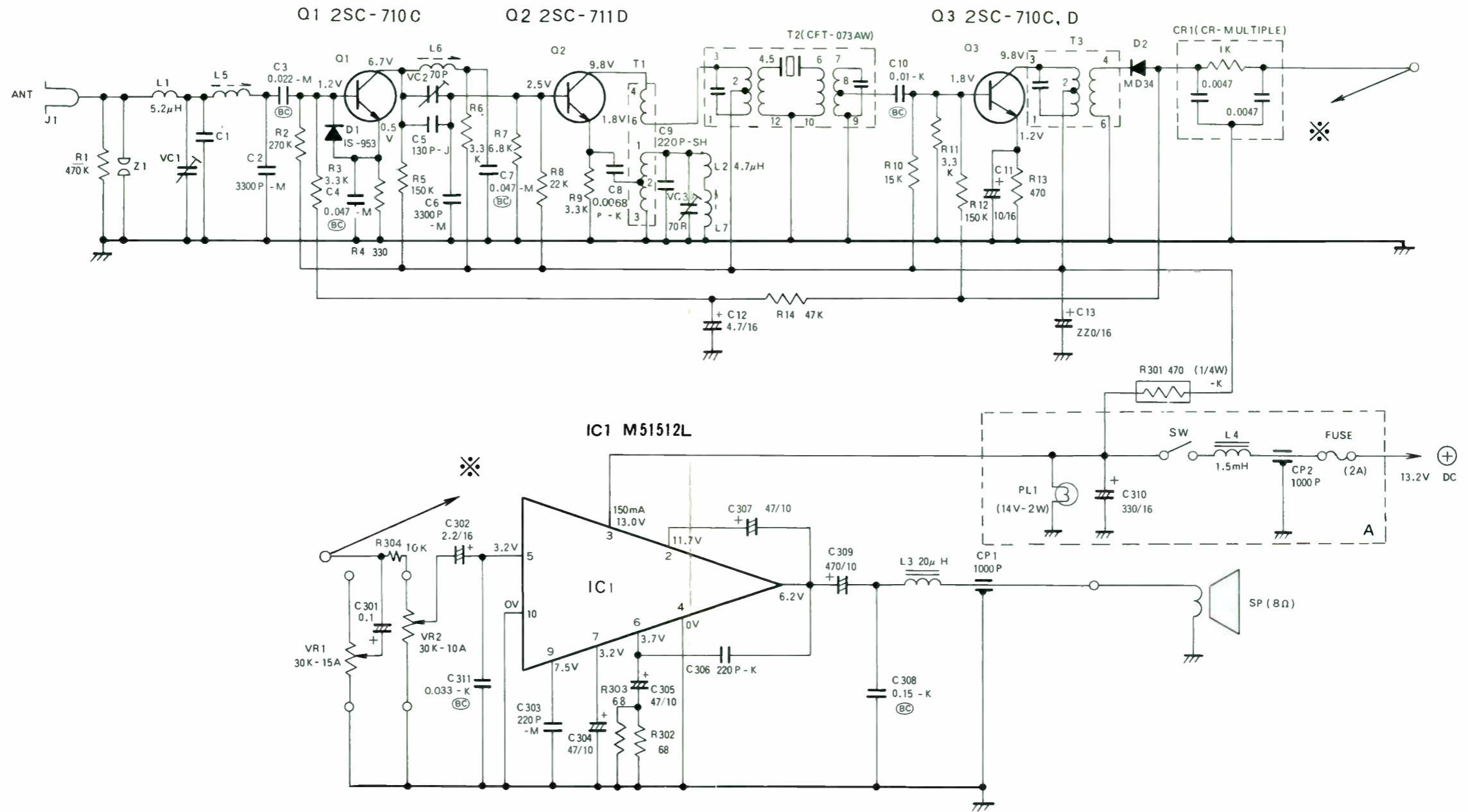
PRINTED CIRCUIT BOARD AND WIRING DIAGRAM (Printed Side)

(MODEL AR-3250SE)



MARK PRINTED RESISTORS

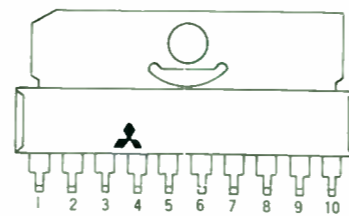
Chrysler By Mitsubishi Plymouth Arrow AR-3250SE



NOTICE:

1. All resistors are ohms unless otherwise specified K=10³ ohm, M=10⁶ ohm
2. All capacitors are microfarads unless otherwise specified P=10⁻⁶ microfarad.
3. Expression of resistors.
 - Kinds (S) mark Composition resistor
 - No mark Carbon resistor or Printed resistor
 - Watt No indication = 1/4W
 - Permission-difference J=±5% No indication=±10%
4. Expression of capacitors
 - Kinds (P) mark Polyester film capacitor
 - (S) mark Styrol capacitor
 - (BC) mark Ceramic capacitor type BC
 - (ML) mark Polypropilene film capacitor
 - No mark Ceramic capacitor
 - Permission-difference J=±5%, K=±10%, M=±20%
5. Each terminal-voltage taken with circuit tester at the minimum position of volume control when no signal is given.
6. Supply voltage maintained at rated value for voltage readings. (13.2V)

(IC TERMINAL)



IC M51512L

Chrysler By Mitsubishi Plymouth Arrow AR-3250SE

PARTS LIST

In order to expedite delivery of replacement part orders, unless full information is supplied, delay in processing of orders will result.

Specify :
 1. Model number
 2. Part number and Description
 3. Quantity

Symbol No.	Part No.	Description	Remarks	Symbol No.	Part No.	Description	Remarks
Capacitors							
C1	154P02208	47pF±5%	Ceramic	R 301	•	470Ω±10% ¼W	Carbon
2	•	3300pF±20%	"	302	•	68Ω	Printed Carbon
3	•	0.022μF±10%	"	303	•	68Ω±10% ¼W	Carbon
4	•	0.047μF±20%	"	304	•	10kΩ " "	"
5	154P02309	130pF±5%	"	VR1,2	122L05703	30kΩ-Ax2	Variable
6	•	3300pF±20%	"	Semiconductors			
7	•	0.047μF±20%	"	Q1	260P17103	2SC710-C	Transistor
8	•	0.0068μF±10%	Polyester	2	260P17503	2SC711-D	"
9	154P10404	220pF±5%	Ceramic	3	260P17102	2SC710-C,D	"
10	•	0.01μF±10%	"	IC1	266P31701	M51512L	IC
11	181P06709	10μF/16WV	Electrolytic	D1	264P11701, 264P00401	1S953 MD34	Diode
12	181P06202	4.7μF/10WV	"	Transformers and Coils			
13	181L01206	220μF/16WV	"	L1	351L00103	5.2μH	Choke Coil
301	181P04003	0.1μF/10WV	Electrolytic	2	351D02103	4.7μH	"
302	181P06200	2.2μF/16WV	"	3	351M00201	20μH	"
303	•	2200pF±20%	Ceramic	5~7	295K03601		Tuner
304	181P06009	47μF/10WV	Electrolytic	T1	373M00102		OSC Transformer
305	"	"	"	3	374L00401		IF Transformer
306	154P02705	220pF±10%	Ceramic	4	351P00106		Choke Transformer
307	181P06009	47μF/10WV	Electrolytic	Others			
308	•	0.15μF±10%	Ceramic	T2	299P00801		Ceramic Filter
309	181L01102	470μF/10WV	Electrolytic	CR1	149L00201		CR Multiple
310	181L01204	330μF/16WV	"	Z1	224D01901		Air Gap
311	•	0.033μF±10%	Ceramic	PL1	253D00301		Lamp
CP1~3	189P05401	1000pF	Lead through type		704D91802		Knob-A
VC1	202L00501		Trimmer		704M01902		Knob-B
2,3	202P10601		"		707L04001		Dial
Resistors					704M13901		Shaft Trimmer
R1	•	470kΩ	Printed Carbon		986L02101		Assy Pointer
2	•	270kΩ	"		923J0110 1		Assy PWB
3	•	3.3kΩ	"		452L0190 1		Connector
4	•	330Ω	"		224L00101		Cover Fuse
5	•	150kΩ	"		283P00102		Fuse (2A)
6	•	3.3kΩ	"		449D00302		Antenna Socket
7	•	6.8kΩ	"		531M07102		Tuning Shaft
8	•	22kΩ	"		704M18202		Tuner Button
9	•	3.3kΩ	"		281K02001		Pillar Antenna
10	•	15kΩ	"		480P61307		Speaker
11	•	3.3kΩ	Printed Carbon				
12	•	150kΩ	"				
13	•	470Ω	"				
14	•	47kΩ	"				

7. GUIDE TO TROUBLE REPAIR

TROUBLE REPAIR

Troubles	Check	Judgement	Trouble causes
Close a current			<ul style="list-style-type: none"> • Fuse open • L4 open • SW damaged
Fuse broken			<ul style="list-style-type: none"> • CP2 soldering no good • L4 lead short • C310 short
No sound	Pick the pin 1 of the IC1 with tweezers "click" sounds?	No	<ul style="list-style-type: none"> • IC1 damaged • L3 open • C309 open or short • C303, 305, 307, 308 short
		Yes	<ul style="list-style-type: none"> • C304, 311 short • C302 open or short • IC1 damaged
	Q3 voltage Ec 9.8V Eb 1.8V Ee 1.2V	Ec OV	• T3 open
		Ec UP	• R10 open or C15 short
		Eb Ee OV	
		Ec UP	• R13 open
	Eb Low varies		
		Ee OV	• C11 short
		Drop	
	Q2 voltage Ec 9.8V Eb 2.5V Ee 1.8V	Ec OV	• T1, 2 open
		Ec UP	• R8 open or C6 short
		Eb, Ee OV	
Ec UP		• R9 open	
Eb Low varies			
	Ee OV	• VC3, L2, L7 damaged	
	Proper (Tuning poor condition)		
Q1 voltage Ec 6.7V Eb 1.2V Ee 0.5V	Ec OV	• R6, L6 open	
	Ec UP	• R2 open or C4 short	
	Eb, Ee OV		
	Ec UP	• R4 open	
	Eb Low varies		
		Ee OV	• D1 short
	Ec UP		
	Eb Drop		
	Ee OV		

ALIGNMENT INFORMATION

FM ALIGNMENT

AM/FM STEREO RADIO/QUAD TAPE PLAYER MODEL D9LF

EQUIPMENT

1. Power Supply — Hewlett Packard 6285A or equivalent.
2. A-C VTVM — Hewlett Packard 400H or equivalent.
3. FM Generator — Boonton 202H or equivalent.
4. Oscilloscope — Tektronix 504 or equivalent.
5. RF Voltmeter or Detector Probe (See Diagram A for information on building an RF detector probe.).
6. Varactor tuning voltage from Logic panel.
7. Distortion Analyzer — Hewlett Packard 330B or equivalent.
8. Digital Voltmeter.

SERVICE NOTES

Before proceeding with the FM alignment, read the Service Notes.

Use a VTVM with an input impedance of 1 megohm or greater for voltage measurements. A wiring method as shown in Figure 17 can be used when performing FM alignment.

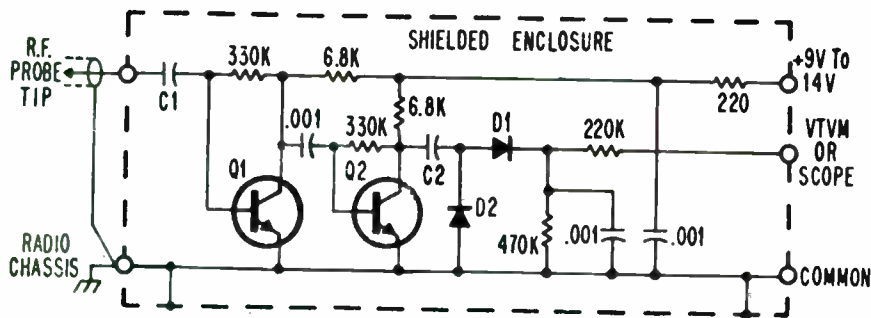
PRELIMINARY INFORMATION

1. Disassemble as required, remove top cover and right hand side housing containing FM panel.
2. Connect +14 VDC power supply to A+ cable lead and negative lead to radio chassis.
3. Press FM mode switch for FM operation.
4. Connect RF signal generator through dummy antenna to antenna input jack J101. (Refer to Diagram C for dummy antenna configuration.) Use 400 Hz modulation, +25 kHz deviation signal at frequency indicated and keep generator output at 1 millivolt in complete FM alignment procedure (except where otherwise indicated).
5. Use test point P101 (P112) Junction of D105 anode and R139 for indication of FM audio output.

PARTIAL FM ALIGNMENT PROCEDURE FOLLOWING PARTS REPLACEMENT

When replacing a component on the FM tuner panel, alignment should be performed only on the component replaced. The procedure in each case is shown in simplified chart form below.

PART REPLACED	GENERATOR SETTING	ADJUSTMENT FOR MAX. OUTPUT
T103	88.1 MHz	T103
VC103	107.9 MHz	VC103
VC101, VC102	107.9 MHz	Only the capacitor or capacitors replaced
T101, T102	88.1 MHz	Only the coil or transformer replaced
VRAC103	107.9 MHz	VC103
	88.1 MHz	T103
VRAC101 VRAC102	107.9 MHz	The associated capacitor (VC101 or VC102)
	92.1 MHz	The associated coil or transformer (T101 or T102)
T105 FM Detector Coil	Follow procedure as explained in step 15 of COMPLETE FM ALIGNMENT PROCEDURE.	



PARTS LIST

C1	1pF	3L0-11093
C2	10pF	3L0-0010-6
D1, D2	-	3L4-2001-3
Q1, Q2	AR211	3L4-6007-12

DIAGRAM A. RF DETECTOR PROBE SCHEMATIC

COMPLETE FM ALIGNMENT PROCEDURE

STEP	PROCEDURE
1	Connect VTVM or scope to test point P101 (P112) for indication of FM audio output.
2	Apply 1.8 to 2.0 VDC from low impedance source (50 ohms or less) to base of Q101 to defeat AGC or ground collector of Q104.
3	Connect RF voltmeter or scope to output of F102 (junction of F102 and R133). If RF voltmeter is not available, use detector probe suggested in Diagram A.
4	Connect digital voltmeter to FM tuning voltage line at P128.
5	With UP/DN button tune radio to 107.9 MHz. Push SET button, then #5 RECALL button to lock-in voltage setting.
6	Adjust oscillator trimmer VC103 for $6.5 \pm .1$ VDC on digital voltmeter (tuning voltage).
7	Set generator to 107.9 MHz.
8	Adjust antenna trimmer VC101 and RF trimmer VC102 for max. output on scope or meter. Adjust generator output as needed to prevent limiting in N101.
9	With UP/DN button tune radio to 88.1 MHz. Push SET button, then #1 RECALL button to lock-in voltage setting.
10	Adjust oscillator transformer T103 for $.75 \pm .05$ VDC on digital voltmeter.
11	Set generator to 88.1 MHz.
12	Adjust antenna coil T101 and RF transformer T102 for max. output on scope or meter.
13	Repeat steps 5 through 8. If output reading on scope or meter is within 1 dB of max. output, no further tuning is required. If output is not within limit specified, repeat steps 5 through 12 until output is within the limit.
14	With UP/DN button tune radio to 98.1 MHz. Set generator to 98.1 MHz, 75 KHz deviation and 1 millivolt output. Record audio output level.
15	Align FM Detector as follows: a. Adjust generator frequency for 10.7 MHz. b. Set generator to 75 KHz deviation, 400 Hz modulated signal at 1 millivolt output. c. Adjust FM detector coil T105 for max. output on scope or meter at test point P101 (P112). d. Reduce generator output for 1 dB below limiting and readjust T105 for max. output.

COMPLETE FM ALIGNMENT PROCEDURE (Cont'd)

STEP	PROCEDURE
16	Adjust DC reference as follows: a. Tune radio to a local station. b. Connect VTVM or digital meter to IC101 pin #1 at P122 and record voltage reading. c. Connect VTVM or digital meter to P124 and adjust DC reference voltage for same voltage found at P122.
	Note: Check DC output at P112 with no signal (disconnect antenna cable) compared to the DC output on local stations. These voltages should be within $\pm .2$ volt of each other.

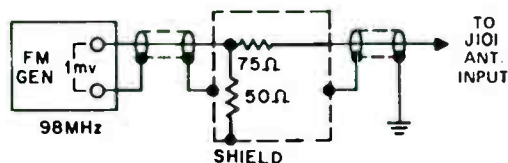


DIAGRAM B FM DUMMY ANTENNA

MPX ALIGNMENT

AM/FM STEREO RADIO/QUAD TAPE PLAYER MODEL D9LF

EQUIPMENT

Frequency Counter – Itron 600 or equivalent.

SERVICE NOTES

Good multiplex operation requires proper alignment of FM RF, I. F., and detector circuits. See Troubleshooting Procedure before proceeding to determine whether multiplex alignment is necessary.

This phase-locked loop IC multiplex decoder system is quite simple to align as only adjustment of the 76KHz oscillator is required. This system also provides inherent rejection of unwanted signals, such as SCA, and rejection of supply line transients since the IC has an internal power supply regulator.

PRELIMINARY INFORMATION

1. Connect +14 VDC output from power supply to A+ cable lead, and negative lead of power supply to radio chassis.
2. Use 76KHz oscillator test point (pin 11, IC301) for indication of oscillator output. (Do not short to adjacent pins when using pin 11 as test point.) (FM Mode)
3. Tune radio to unmodulated FM signal of about 1.0 mv (to quiet FM noise) or disconnect J303 (J331 and J332) connector from FM panel.

MPX ALIGNMENT PROCEDURE

STEP	PROCEDURE
1	Connect frequency counter to 76KHz osc. test point.
2	Adjust 76KHz osc. control VR301 for 18,950 to 19,050 Hz on frequency counter.

AM ALIGNMENT

AM/FM STEREO RADIO/QUAD TAPE PLAYER MODEL D9LF

EQUIPMENT

1. Power Supply — +14.0 VDC @ 6 amps minimum.
2. Variable Voltage Supply — 0 to -40 VDC.
3. A-C VTVM or equivalent.
4. AM Signal Generator — 400 KHz to 1600 KHz range (levels 1 μ V to 1 Volt).
5. Oscilloscope — 2 MHz bandwidth minimum.
6. Digital Voltmeter.
7. Frequency Counter to 5 MHz.

PRELIMINARY INFORMATION

1. Disassemble radio as required (see disassembly instructions), remove bottom cover with tape deck assembly. Place tape deck in vertical position alongside radio and connect interconnecting cables (see Figure 10).
2. Connect four 3.2 ohm load resistors or speakers to speaker cable.
3. Connect +14.0 VDC supply to A+ cable lead and negative lead to radio chassis ground.
4. Connect AM signal generator (30% 400 Hz modulation) as directed in alignment procedures. (See Diagram C for dummy antenna circuit.) (No pre-trim adjustments are required.)
5. Connect VTVM or scope to R257 for AM audio output (junction of L205, R257 and C245).
6. Depress AM mode switch for AM operation.

AM IF ALIGNMENT PROCEDURE

STEP	SPECIAL INSTRUCTIONS	SIGNAL GENERATOR		RECEIVER
		CONNECTION TO RECEIVER	DIAL SETTING	ADJUST
1	Follow preliminary instructions.	Thru dummy antenna (Diagram C) to antenna input.	455 KHz 30% 400 Hz modulation 50 mv RMS	T207 (2 cores) for max. indication on scope or VTVM.
2	Same as step 1.			T208 for max.
3	Same as step 1.			L202 for minimum.

AM RF ALIGNMENT

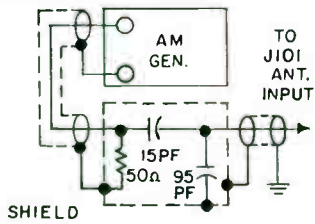
PRELIMINARY INFORMATION

1. Set signal generator level for 1 mv RMS and frequencies indicated below.
2. Disable AM local oscillator by grounding base of Q207 to chassis with test clip lead.
3. Connect variable voltage supply (0 to -35 VDC) to junction of R204 and R231 (junction of R204, R231, R208 and C252); monitor variable voltage with digital voltmeter when adjusting voltage during alignment procedure.
4. Connect scope to base of mixer (Q210), adjust vertical sensitivity for 5 mv/cm.

SERVICE NOTE

**DO NOT ADJUST T201, T203 or T206;
NO ADJUSTMENT IS REQUIRED.**

AM RF ALIGNMENT PROCEDURE

STEP	SPECIAL INSTRUCTIONS	SIGNAL GENERATOR		VARIABLE VOLTAGE SUPPLY	RECEIVER
		CONNECTION TO RECEIVER	DIAL SETTING		ADJUST
1	Follow preliminary instructions.	Thru dummy antenna (Diagram C) to antenna input.	600 KHz 1 mv RMS	-2.5 VDC	T202 and T204 for max. indication on scope.
2	Same as step 1.		1500 KHz 1 mv RMS	-24.75 VDC	VC201 and VC202 for max.
3	Repeat steps 1 and 2 until no further improvement can be made.				
4	Same as step 1. NOTE: Record voltage setting found during this step for use in osc. alignment. (between -9.0V and -11.0V)	Same as step 1 	900 KHz 1 mv RMS	Adjust voltage for maximum indication on scope. (See note in special instructions.)	

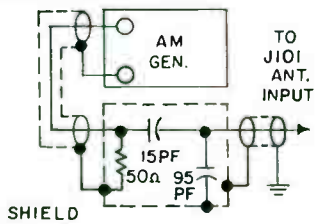


DIAGRAM C
AM DUMMY ANTENNA
AM OSCILLATOR ALIGNMENT

PRELIMINARY INFORMATION

1. Remove grounding clip lead from base of Q207 (AM osc.).
2. Connect scope to AM audio detector output (junction of L205, R257 and C245); set scope vertical sensitivity for 200 mv/cm.
3. Set generator signal level for approximately 20 microvolts, 30% 400 Hz modulation.

AM OSCILLATOR ALIGNMENT PROCEDURE

STEP	SPECIAL INSTRUCTIONS	SIGNAL GENERATOR		VARIABLE VOLTAGE SUPPLY	RECEIVER
		CONNECTION TO RECEIVER	DIAL SETTING		ADJUST
1	Follow preliminary instructions. NOTE: Adjust signal level for 120 mv, P/P on scope to avoid AGC action.	Thru dummy antenna (Diagram C) to antenna input.	900 KHz 30% mod.	Set for voltage found in step 4 of AM RF alignment.	T205 for max. on scope (normal approx. 120 mv, P/P).
2	Same as step 1.		1500 KHz 30% mod.		-24.75 VDC
3	Repeat steps 1 and 2 until no further improvement can be made.				

AM OSCILLATOR ALIGNMENT PROCEDURE (Cont'd)

STEP	SPECIAL INSTRUCTIONS	SIGNAL GENERATOR		VARIABLE VOLTAGE SUPPLY	RECEIVER
		CONNECTION TO RECEIVER	DIAL SETTING		ADJUST
4	Same as step 1. NOTE: If level on scope is same as in step 1, then no further adjustment is necessary. If level is less than 60 mv P/P (6 dB down), adjust T205 for same level as step 1.	Same as step 1.	600 KHz 30% mod.	-2.5 VDC	T205 for same level as in step 1. See note in special instructions.
5	Repeat steps 1 and 4 until output levels are approximately same.				
6	Repeat step 2.				

HEAD HEIGHT ADJUSTMENT

Improper head height is evidenced by crosstalk or poor separation. This is a condition when sound from adjacent tracks is also picked up by the head in addition to the desired track. To make the head height adjustment, follow the procedure given below.

1. Play a test alignment tape with a height test track. Follow instructions provided with test tape and adjust height adjust screw for proper output. Output can be monitored with VTVM at speaker cable connectors J320 for each channel.
2. If suitable test tape is not available, play an 8-track quad or stereo cartridge and make height adjustment for best sound and a null in crosstalk.

HEAD AZIMUTH ADJUSTMENT

The need for head azimuth adjustment is evidenced by poor high frequency response and a lower output. The azimuth adjustment actually tilts the head for proper alignment of the head with the tape track. To make the head azimuth adjustment, follow the procedure given below.

1. Play a test alignment tape with an azimuth test track. Follow instructions provided with test tape. Connect VTVM to speaker cable connector J320 for each channel. Adjust azimuth adjust screw for maximum output. Use care not to short terminals on track advance solenoid.
2. Because head height and head azimuth adjustments interact, repeat height and azimuth adjustments for best response. Avoid using magnetized tools near head and demagnetize head after adjusting.

TAPE PRE-AMP GAIN ADJUSTMENT

Each amplifier section of the four tape pre-amps contains a gain adjustment control. This gain adjustment is required to compensate for differences in the tape head on each channel. To make these gain adjustments, play a quad test alignment tape having a standard 400 Hz test tone. Follow instructions provided with test tape. The following instructions can be followed.

1. Connect a VTVM or power meter to speaker connection of speaker cable connector J320 for each channel output; use a 3.2 ohm load resistor or speaker for loading. Set Volume, Balance Left-Right and Balance Front-Back controls to mid-position and Tone control to maximum Left (treble) position. Adjust gain controls VR901 (L. F.), VR902 (R. F.), VR903 (R. R.) and VR904 (L. R.) for equal outputs of .8 volt (RMS) on VTVM or .2 watt on power meter for each channel.

FM TUNER PANEL TROUBLESHOOTING

AM-FM STEREO RADIO/QUAD TAPE PLAYER MODEL

After a trouble has been localized to the FM tuner panel, follow systematic troubleshooting procedures using the troubleshooting chart for assistance in locating the trouble.

The FM panel can be tilted out from the chassis for servicing. The FM panel can also be powered by a separate 14 volt B+ source to P126 and an external varactor tuning voltage to P128 obtained through a 10K potentiometer across a 9 volt battery.

FM TUNER PANEL TROUBLESHOOTING CHART

TROUBLE SYMPTOM	PROBABLE CAUSE	CORRECTION
Low audio on station	<ol style="list-style-type: none"> 1. IC101, IC102 or N101 2. T105 3. VR101 	<ol style="list-style-type: none"> 1. Check IC101, IC102, N101 and associated circuit for faulty component. 2. Align T105. 3. Adjust VR101.
Can't tune FM	<ol style="list-style-type: none"> 1. No Varactor tuning voltage 2. Varactor tuning voltage does not change when manually tuning FM 	<ol style="list-style-type: none"> 1. Check connector P101 (P128) to logic panel for tuning voltage. 2. Defective IC401, IC403 or IC404 on logic panel.
No FM station or sound – AM is OK	<ol style="list-style-type: none"> 1. No FM B+ 2. IC101, IC102 or T105 	<ol style="list-style-type: none"> 1. Check for open connection in FM B+ line. 2. Check voltage and resistance readings to locate defective component.
Poor sensitivity and/or selectivity	<ol style="list-style-type: none"> 1. Defective antenna socket 2. Defective C103, VC101, VRAC101, T101 or Q101 3. F101 or F102 4. Q104 5. VR101 	<ol style="list-style-type: none"> 1. Check and replace as necessary. 2. Check circuit and replace defective component. 3. Check dB loss through ceramic filters (–3 dB drop is normal). 4. Check for proper d-c voltage at base of Q101 with no signal (see schematic). 5. Check for d-c reference voltage at VR101.
Noisy between stations when tuning FM	<ol style="list-style-type: none"> 1. Defective mute circuit 	<ol style="list-style-type: none"> 1. Refer to Logic panel troubleshooting.
No FM station stop during seek mode	<ol style="list-style-type: none"> 1. Defective IC101 2. T105 3. VR101 	<ol style="list-style-type: none"> 1. Check IC101 circuit. 2. Check T105 alignment. 3. Check reference voltage adjustment of VR101.

AM-FM STEREO RADIO/QUAD TAPE PLAYER MODEL

After a trouble has been localized to the FM tuner panel, follow systematic troubleshooting procedures using the troubleshooting chart for assistance in locating the trouble.

The FM panel can be tilted out from the chassis for servicing. The FM panel can also be powered by a separate 14 volt B+ source to P126 and an external varactor tuning voltage to P128 obtained through a 10K potentiometer across a 9 volt battery.

FM TUNER PANEL TROUBLESHOOTING CHART

TROUBLE SYMPTOM	PROBABLE CAUSE	CORRECTION
Low audio on station	<ol style="list-style-type: none"> 1. IC101, IC102 or N101 2. T105 3. VR101 	<ol style="list-style-type: none"> 1. Check IC101, IC102, N101 and associated circuit for faulty component. 2. Align T105. 3. Adjust VR101.
Can't tune FM	<ol style="list-style-type: none"> 1. No Varactor tuning voltage 2. Varactor tuning voltage does not change when manually tuning FM 	<ol style="list-style-type: none"> 1. Check connector P101 (P128) to logic panel for tuning voltage. 2. Defective IC401, IC403 or IC404 on logic panel.
No FM station or sound - AM is OK	<ol style="list-style-type: none"> 1. No FM B+ 2. IC101, IC102 or T105 	<ol style="list-style-type: none"> 1. Check for open connection in FM B+ line. 2. Check voltage and resistance readings to locate defective component.
Poor sensitivity and/or selectivity	<ol style="list-style-type: none"> 1. Defective antenna socket 2. Defective C103, VC101, VRAC101, T101 or Q101 3. F101 or F102 4. Q104 5. VR101 	<ol style="list-style-type: none"> 1. Check and replace as necessary. 2. Check circuit and replace defective component. 3. Check dB loss through ceramic filters (-3 dB drop is normal). 4. Check for proper d-c voltage at base of Q101 with no signal (see schematic). 5. Check for d-c reference voltage at VR101.

AM TUNER TROUBLESHOOTING

AM-FM STEREO RADIO/QUAD TAPE PLAYER MODEL

After a trouble has been localized to the AM tuner section of the AM/MPX/AUDIO panel, follow systematic troubleshooting procedures using the troubleshooting chart and signal tracing procedures chart for assistance in locating the trouble. For servicing, the AM tuner circuit can be operated in the following ways:

1. Connect 14 Volts to main A+ cable and four 3.2 ohm speakers (or four 3.2 ohm load resistors) connected to speaker cable.
2. AM Radio Section - B+ supply to P315, AM audio output at junction of D208, L205 and R251, AM input signal to P303 (P332), External Varactor tuning Voltage Supply (0 to -35V) to J316.

AM TUNER SECTION TROUBLESHOOTING CHART

TROUBLE SYMPTOM	PROBABLE CAUSE	CORRECTION
Dead AM reception – air signal FM OK	Ant. cable – FM panel to AM input J102 (J121 & J122) to P303 (P331 & P332)	Check for poor connection, open wire or terminal.
Poor sensitivity with signal greater than 50 microvolts	1. Misalignment due to shift in VC201, VC202, VC303, T202, T204 or T205 2. Defective Q201, Q202, Q203, Q210, Q211, Q212 or Q213	1. Check for alignment. 2. Use signal tracing procedure to localize defective stage.
Oscillates at mid-position of volume control	1. Possible poor grounds at heat sink PW panel mounting 2. AGC filtering questionable 3. AM B+ filtering	1. Check mounting screws for tightness and seating. 2. Check C226 and C227. 3. Check C210, C212 and C205. Replace defective component.
Dead AM reception – air signal or signal generator – requires signal greater than 500 mV	1. No tuning voltage for varactor diodes 2. Defective Q207, Q208, Q209 or component in AM oscillator loop circuit	1. Check P404 pin P446 for .8 V to –37 volts. 2a. Check P404 pin P445 for –35 volts. 2b. Check transistor operating voltages.

AM TUNER SECTION SIGNAL TRACING VOLTAGE CHART

Signal Gen. to J101 thru Dummy Antenna*	SIGNAL AT TEST POINTS					
	Cascode Q201 Gate	RF Amp Q203 Base	Mixer Q210 Base	1st IF Q211 Base	2nd IF Q212 Base	AM Detector D208 Anode
3 to 6 μ V 1 MHz 30% mod. 1 KHz	approx. .5 μ V 1 MHz 30% mod. 1 KHz	1.3 to 2.0 μ V 1 MHz 30% mod. 1 KHz	26 to 40 μ V 455 KHz 30% mod. 1 KHz	1.4 to 2.0 mV rms 455 KHz 30% mod. 1 KHz	2.0 mV rms 455 KHz 30% mod. 1 KHz	150 mV rms 455 KHz 30% mod. 1 KHz
			35 to 50 μ V 1 MHz 30% mod. 1 KHz			

*See Diagram C dummy antenna in AM alignment procedures.

AM Tuner and Varactor P.S. Transistors
Voltage and Resistance Checks

Should suspicion or troubleshooting checks point to the possibility of a faulty transistor, it is recommended that voltage and resistance measurements be

made at the terminals of the transistor on the panel before proceeding with replacement. Attempt to make sure the transistor is at fault to avoid an unnecessary replacement. The normal, averaged d-c voltage (to ground) values are given on the schematic; the d-c resistance (to ground) values are given in the accompanying chart and measured with a VTVM.

**AM TUNER TRANSISTORS
DC RESISTANCE CHART**

TRANSISTOR	*RESISTANCE (OHMS)		
	S	G	D
Q201	140	1.3K	160
Q202	160	1.1K	200
	E	B	C
Q203	330	1.1K	200
Q204	0	900	INF.
Q205	0	925	2K
Q206	700	1.9K	8K

TRANSISTOR	*RESISTANCE (OHMS)		
	E	B	C
Q207	110	1.3K	800
Q208	250	1.5K	750
Q209	20	650	300
Q210	700	1.2K	300
Q211	390	825	3.5K
Q212	5.6**	950	500
Q213	1.6K	1.8K	410

*All readings RX100 scale unless otherwise noted.
**RX1 scale.

MPX-AUDIO TROUBLESHOOTING

AM-FM STEREO RADIO/QUAD TAPE PLAYER MODEL

After the trouble has been localized to the MPX/AUDIO portion of the AM/MPX/AUDIO panel, follow systematic troubleshooting procedures using the troubleshooting charts for assistance in locating the trouble.

For servicing, the AM/MPX/AUDIO panel can be interconnected using the wiring method shown in Figure 17 or in the following ways:

1. MPX Decoder Section and Audio Section — 14 volts fed to main A+ cable and J314, and four 3.2 ohm speakers (or 3.2 ohm load resistors) connected to speaker cable.
2. Volume and tone controls can be bypassed by connecting jumpers from P304 (P343) to P317 and P316, and from P304 (P342) to P319 and P318.

AM/MPX/AUDIO PANEL DECODER SECTION TROUBLESHOOTING CHART

TROUBLE SYMPTOM	PROBABLE CAUSE
No AM or FM audio output – Tape audio OK	Defective mute transistor Q301, Q302 or Q303
No FM audio – AM and Tape OK	IC301 defective
No stereo indicator Monaural FM audio only – AM and Tape audio OK	IC301 defective
No stereo indicator and Stereo audio low in volume	IC301 defective
No stereo indicator Audio OK on AM-FM-stereo	Stereo indicator or Q414 defective; refer to Logic panel troubleshooting

AM/MPX/AUDIO PANEL DECODER SECTION TROUBLESHOOTING CHART (Cont'd)

TRouble SYMPTOM	PROBABLE CAUSE
Right channels 50% down from left channels on FM only	IC301 defective
Left channels 50% down from right channels	IC301 defective
Monaural output at all times, stereo light operates OK, volume good, stereo sounds like monaural	No separation – check alignment C301 reversed or high leakage

MPX IC

Voltage and Resistance Checks

Should suspicion or troubleshooting checks point to the possibility of a faulty IC, it is recommended that voltage and resistance measurements be made at

the terminals of the chip on the panel before proceeding with replacement. Attempt to make sure the IC is at fault to avoid an unnecessary replacement. The normal, averaged d-c voltage (to ground) values are given on the schematic; the d-c resistance (to ground) values are given in the accompanying chart as measured with a VTVM.

(PIN NO.)	*RESISTANCE (OHMS)															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
IC301	5.4K	1.3K	1.3K	950	950	1.1K	1.3K	0	5.4K	5.4K	5.5K	5.4K	5.4K	5.4K	5.4K	600

*All readings RX100 scale unless otherwise noted.

AUDIO SECTION TROUBLESHOOTING

AM-FM STEREO RADIO/QUAD TAPE PLAYER MODEL

When trouble appears to be in the Audio section, the most vulnerable component is the output IC. The most serious fault would be a short to ground of the output emitter point (Pin 4) of IC302, IC303, IC304 or IC305. When this happens, it is possible for IC to be destroyed. Refer to troubleshooting chart for assistance in locating the trouble. All voltages and resistances measured (to ground) with VTVM.

IC	*RESISTANCE (OHMS)				
(Pin No.)	1	2	3	4	5
302	100K**	3.0K	0	240	800
303	100K**	3.0K	0	240	800
304	100K**	3.0K	0	240	800
305	100K**	3.0K	0	240	800

*All readings X100 scale except where indicated otherwise.

**X10K scale.

AUDIO OUTPUT TROUBLESHOOTING CHART

TRouble SYMPTOM	PROBABLE CAUSE
More than 8.0 volts at output pin 4 of IC2	1. Defective IC2
Less than 6.5 volts at output pin 4 of IC2	1. Defective (shorted) IC2 2. Shorted C23
Excessive current and fuse blows	Defective IC2
Excessive current	Speaker lead shorted

LOGIC AND DISPLAY PANEL TROUBLESHOOTING

AM-FM STEREO RADIO/QUAD TAPE PLAYER MODEL

After trouble has been localized to the Logic and display panels, follow systematic troubleshooting procedures using the troubleshooting chart for assistance in locating the trouble.

CAUTION: Handling of Integrated Circuits

MOS devices are high input impedance devices and are susceptible to damage when exposed to static electrical charges. To avoid possible damage to the ICs during testing, handling, or actual operation, the following procedures should be observed.

1. The pins of the devices should be in contact with a conductive material to avoid build-up of static charge, except when being tested or in circuit operation.
2. Turn power off before removing device from circuit. Transient voltages can cause permanent damage to the device during removal or insertion with power on.
3. Ground probes before making measurements during testing to remove possible static charges.
4. All soldering irons, tools, work areas and body should be grounded.

LOGIC AND DISPLAY PANELS TROUBLESHOOTING CHART

TROUBLE SYMPTOM	PROBABLE CAUSE
1. FM freq. display OK and no FM or AM freq. display OK and no AM	1. Defective IC401 or voltage at IC401 pin 3 not correct for mode selected or stays at one voltage for either mode (AM or FM).
1. Can't tune FM – AM OK	1a. Defective IC404, Q428 or IC403. 1b. Check for equal phase lead and lag pulses at IC403 pins 7 & 8. 1c. Check Q428 transistor voltages.
1. Can't tune AM – FM OK	1a. Defective D413, Q419 or Q418 – check for tuning voltage (0 to -37 volts) at D413 anode. 1b. Check for -35 V input at Q419 collector.
1. Won't stop seeking or scanning	1a. Check for shorted seek or scan switch. 1b. Defective IC401 – check control lines, K5, K6 and K7 should be high (11 volts).
1. No station SET or RECALL	1a. Defective IC402. 2. Defective Q420 or Q421, check for -23 volts EAROM (IC402) supply voltage.
1. No mute – noisy between stations when tuning	1a. Defective IC401 – check pin 22 for .5 V normal on station and -11 volts off station. 1b. Check Q301, Q302 and Q303 on AM/MPX/AUDIO panel.
1. Erratic set and recall operation	Defective IC401 or DZ401 – check IC401 pin 20 for 5.5 volts and pin 40 for 11.0 volts.
1. One digit lights very bright	Check IC401 pin 38 for 2.6 MHz signal. If no signal present – check R473, C431, C432 and XTL401. If components are OK, IC401 is defective.

LOGIC AND DISPLAY PANEL TROUBLESHOOTING CHART (Cont'd)

TROUBLE SYMPTOM	PROBABLE CAUSE
1. No intensity or digits do not light	Check IC401 pin 34 for 1.6 KHz sawtooth waveform (5 V p/p). If no sawtooth, check Q430 and C406.
1. All similar segments of each digit are not operational	1a. Check connections between logic and display panels. 1b. Check IC401 pins 26 thru 33 for output waveform (pulses 8 V p/p). 1c. Check IC405 pins 1, 2, 4, 7, 9, 12, 14 and collector of Q413 for output waveform pulses. Replace defective component.
1. One digit does not light	1a. Check respective driver transistor Q422, Q423, Q424 or Q425. Replace defective transistor. 1b. Check connections between Logic and display panels.
1. One or two unrelated segments of digits do not light	1. Replace defective digit module.

LOGIC PANEL TRANSISTORS D-C RESISTANCE CHART

TRANSISTOR	*RESISTANCE (OHMS)		
	E	B	C
Q401	0	1.1K	7.5K
Q402	100	1.1K	2.6K
Q403	0	925	20K**
Q404	680	2.2K	70K**
Q405	0	925	7.5K
Q413	0	850	INF
Q414	0	850	INF
Q415	0	1K	800
Q416	0	800	INF
Q418	50K**	150K**	75K**
Q419	1.3K**	75K**	20K**
Q420	180	25K**	500

TRANSISTOR	*RESISTANCE (OHMS)		
	E	B	C
Q421	190	470	0
Q422	600	1.5K	3.5K
Q423	600	1.5K	3.5K
Q424	600	1.5K	3.5K
Q425	600	1.5K	3.5K
Q426	600	INF	180
Q427	110	600	INF
Q428	925	820	600
Q429	8.8K	75K**	3.5K**
Q430	1.2K	110	1.2K
Q431	INF	6K	600

*All readings RX100 scale unless otherwise noted.
**RX1000 scale.

IC401 AND IC405 VOLTAGE CHART IN RADIO MODE (LOGIC LEVELS)

IC401 CONTROLLER

PIN	FUNCTION	SIGNAL	LOW	HIGH	PIN	FUNCTION	SIGNAL	LOW	HIGH
1	GROUND				21	-	DC		11.0V*
2	10KHz	AC	.5V	11.0V	22	MUTE	DC	.5V	11.0V
3	AM/FM	DC	.5V	11.0V	23	EAROM	DC	.5V	11.0V
4	STOP	DC	.5V	8.0V	24	GROUND	DC	-	-
5	GAIN	DC	.5V	11.0V	25	-	DC	-	11.0V*
6	STEREO	DC	.5V	11.0V	26	DEC. PT.	AC	.5V	11.0V
7	PHASE LEAD (pulse)	AC	.5V	11.0V	27	SEG. G	AC	.5V	11.0V
8	PHASE LAG (pulse)	AC	.5V	11.0V	28	SEG. F	AC	.5V	11.0V
9	VDD	DC		11.0V*	29	SEG. E	AC	.5V	11.0V
10	K7	DC		11.0V	30	SEG. D	AC	.5V	11.0V
11	K6	DC		11.0V	31	SEG. C	AC	.5V	11.0V
12	K5	DC		11.0V	32	SEG. B	AC	.5V	11.0V
13	K4 (625KHz)	AC	.5V	11.0V	33	SEG. A	AC	.5V	11.0V
14	K3 (625KHz)	AC	.5V	11.0V	34	INTEN.	AC	(sawtooth)	
15	K2 (625KHz)	AC	.5V	11.0V	35	AM LO	AC	-	5.0V p/p
16	K1 (625KHz)	AC	.5V	11.0V	36	FM LO	AC	-	5.0V p/p
17	C3	DC	.5V	11.0V	37	OSC. 1 (2.6MHz)	AC	-	4.5V p/p
18	C2	DC	.5V	11.0V	38	OSC. 2 (2.6MHz)	AC	-	6.5V p/p
19	C1	DC	.5V	11.0V	39	N.C.	-	-	-
20	MR (reset)	DC	.5V	5.5V	40	VCC	DC	-	11.0V*

*Nominal state

IC405

PIN		LOW	HIGH
3, 6, 8, 10, 11, 13 & 16	INPUT	0.0V	0.7V
1, 2, 4, 7, 9, 12 & 14	OUTPUT	8.0V	0.5V

8-TRACK TAPE MECHANISM TROUBLESHOOTING

AM-FM STEREO RADIO/QUAD TAPE PLAYER MODEL

After a trouble has been localized to the tape mechanism, follow systematic troubleshooting procedures using the troubleshooting charts for assistance in locating the trouble.

For servicing, the tape player can be interconnected with the radio chassis through connectors* as shown in Figure 10 or using the wiring method shown in Figure 17. The tape mechanism can also be separated completely from the radio chassis and checked as an individual unit. In this test configuration, apply 14 VDC to J841 or J803 and disconnect J802 from P902 to leave the tape pre-amp output unterminated. Use an rms voltmeter or a scope to measure each channel output P902 terminals P921, P922,

*J802/P902, J6/P302, J901/P304 and J805/P701

P923 and P924 for LF, RF, RR and LR channels respectively.

Do not operate the tape player upside down as the cartridge may jam. If it is necessary to operate the unit upside down, use a dummy cartridge.

Defective or inferior quality tape cartridges are the cause of many tape player problems. Before performing service, check the operation with a high quality cartridge known to be good.

The tape player is lubricated at the time of manufacture and normally no further lubrication is required. If lubrication is required because of a part change, use a good grade of light machine oil or white grease, as appropriate. USE VERY SPARINGLY and avoid contamination of the capstan, head, rubber drive belts and other drive surfaces.

8-TRACK TAPE PRE-AMP SECTION TROUBLESHOOTING CHART

TROUBLE SYMPTOM	PROBABLE CAUSE
No tape output — one or both front channels	No input from tape head, IC901, IC903 or IC904 defective. Open input or output capacitor for affected channel.
No tape output — one or both rear channels	No input from tape head, IC902, IC903 or IC904 defective. Open input or output capacitor for affected channel.
Distorted or weak output — one or both front channels	IC901, IC903 or IC904 defective.
Distorted or weak output — one or both rear channels	IC902, IC903 or IC904 defective.
Poor frequency response — both front or rear channels	IC901 or IC902 defective.
Poor frequency response — one channel only	IC901 or IC902 defective, or defective circuitry for affected channel.
No gain adjustment — one channel only	Defective IC901 or IC902, defective gain control or other component of affected channel.
No gain adjustment — both front or rear channels	IC901 or IC902 defective.

8-TRACK QUAD TAPE PLAYER TROUBLESHOOTING CHART

TROUBLE SYMPTOM	PROBABLE CAUSE
Tape player does not turn on	Defective cartridge or cartridge not fully engaged Defective switch actuator or switch contacts on S3 Loose wiring on connectors J1 (JTD61, 62) Blown fuse or low battery voltage
Tape motor runs before cartridge is inserted	Defective radio/tape switch S3
No automatic track change	Defective tape or defective sensing foil at end of program Poor contact between sensing tape and track advance switch S4 Defective solenoid L1 Shorted solenoid diode D1 Head carriage assembly jammed or insufficient tension on head carriage spring Ratchet cam not properly actuated by solenoid
No manual track change	Defective manual track advance switch S802 or loose connection on J805 or J4 (see "No automatic track change")
Erratic head indexing	Track solenoid binding Insufficient tension on solenoid plunger spring Head carriage spring defective or lacks sufficient tension Head carriage guide pin binding Ratchet cam defective
Tape cartridge does not fully engage	Defective spring arm assembly Defective cartridge or foreign material in cartridge opening
Erratic speed (WOW)	Defective cartridge Capstan contaminated with oil or oxide Defective or improperly installed drive belt Binding surfaces, pivot points, or flywheel Defective motor
Dead motor	Shaft binding, defective motor or motor filter circuit Poor electrical connections or insufficient voltage at S3
Slow speed (also refer to "Erratic speed")	Motor defective Motor filter circuitry defective Low battery voltage
Motor runs fast	Motor defective
Crosstalk*	Defective cartridge, defective head Head height out of adjustment Defective carriage housing assembly Tape head binding and not indexing correctly Bent tape guide or misadjusted cartridge lock-spring (see note)

8-TRACK QUAD TAPE PLAYER TROUBLESHOOTING CHART (Cont'd)

TROUBLE SYMPTOM	PROBABLE CAUSE
Poor frequency response	Magnetized tape head Azimuth incorrect Dirty or oxide coated tape head Worn or defective cartridge
Tape breaks or spills*	Defective tape cartridge Defective or dirty capstan or damaged tape stripper Misadjusted cartridge lock-spring assy. (see note)
Drive belt slips off flywheel	Defective or improperly installed drive belts (twisted) Motor not properly seated in required position
Noisy mechanism	Flywheel binding Broken drive belt

*Note: The spring tension of the cartridge lock assembly is adjusted by turning the #6-20 F. H. screw. This screw is properly adjusted and locked with Glyptol at the factory. If it becomes necessary to replace or readjust assembly, proceed as follows: Tighten screw until the clearance between the spring and side of chassis at the closest point is 3/32". Insert a cartridge with music or test tone and while playing pull it out slowly with a pull scale applied at the rear of the cartridge in line with the pinch roller. The cartridge should stop playing (disengage from capstan) with a force of 4 lbs. Adjust screw as necessary and reseal with Glyptol.

Tape Pre-Amp Panel ICs Voltage and Resistance Checks

Should suspicion or troubleshooting checks point to the possibility of a faulty IC, it is recommended that voltage and resistance measurements be made

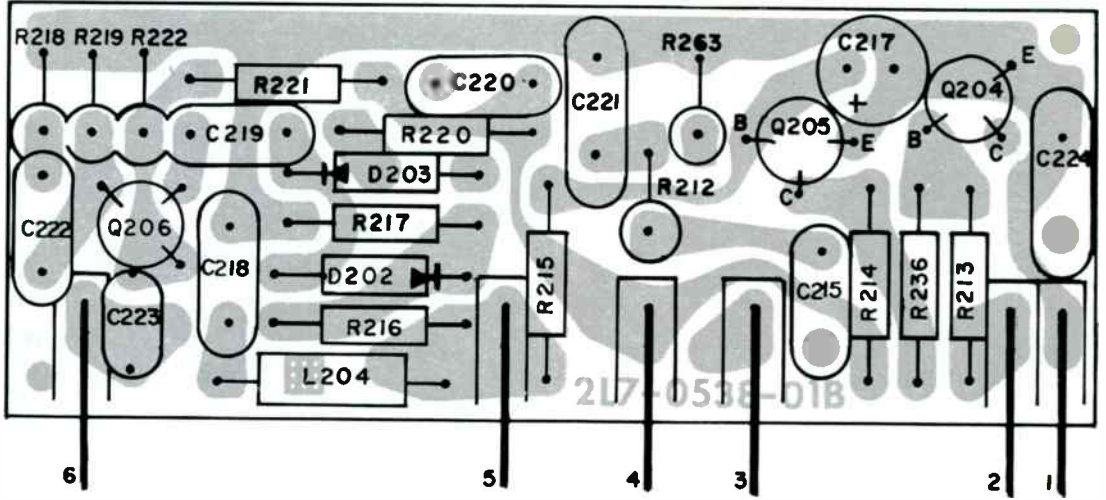
at the terminals of the chip on the panel before proceeding with replacement. Attempt to make sure the IC is at fault to avoid an unnecessary replacement. The normal, averaged d-c voltage (to ground) values are given on the schematic; the d-c resistance (to ground) values are given in the accompanying chart and measured with a VTVM.

TAPE PRE-AMP IC D-C RESISTANCE CHART

(PIN NO.)	* RESISTANCE (OHMS)													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
IC901	75K	75K	0	100K	100K	50K	75K	75K	—	—	—	—	—	—
IC902	75K	75K	0	100K	100K	50K	75K	75K	—	—	—	—	—	—
IC903	100K	75K	75K	100K	100K	** 2.9K	0	150K	100K	100K	100K	** 2.9K	100K	50K
IC904	75K	75K	75K	75K	100K	100K	0	150K	75K	100K	75K	100K	100K	50K
IC905	0	0	NC	NC	0	0	0	** 2.9K	** 2.9K	100K	100K	** 3K	** 3K	75K

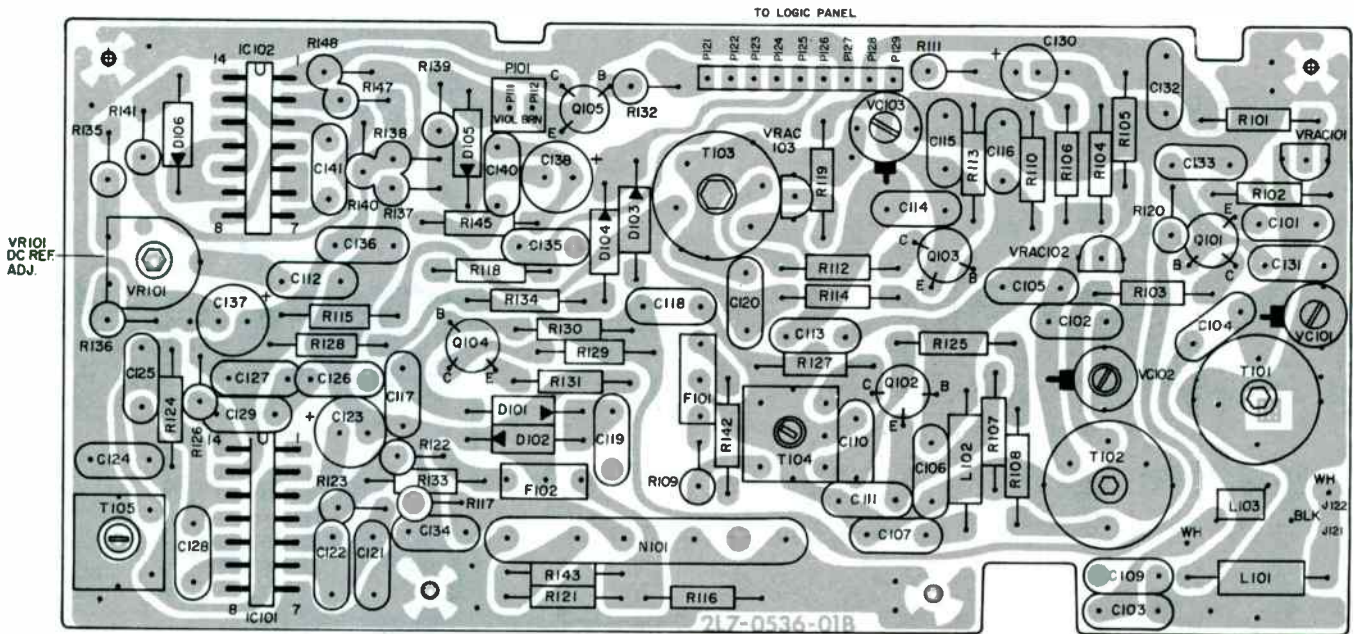
*All readings RX10K scale unless otherwise noted.

**RX100 scale.



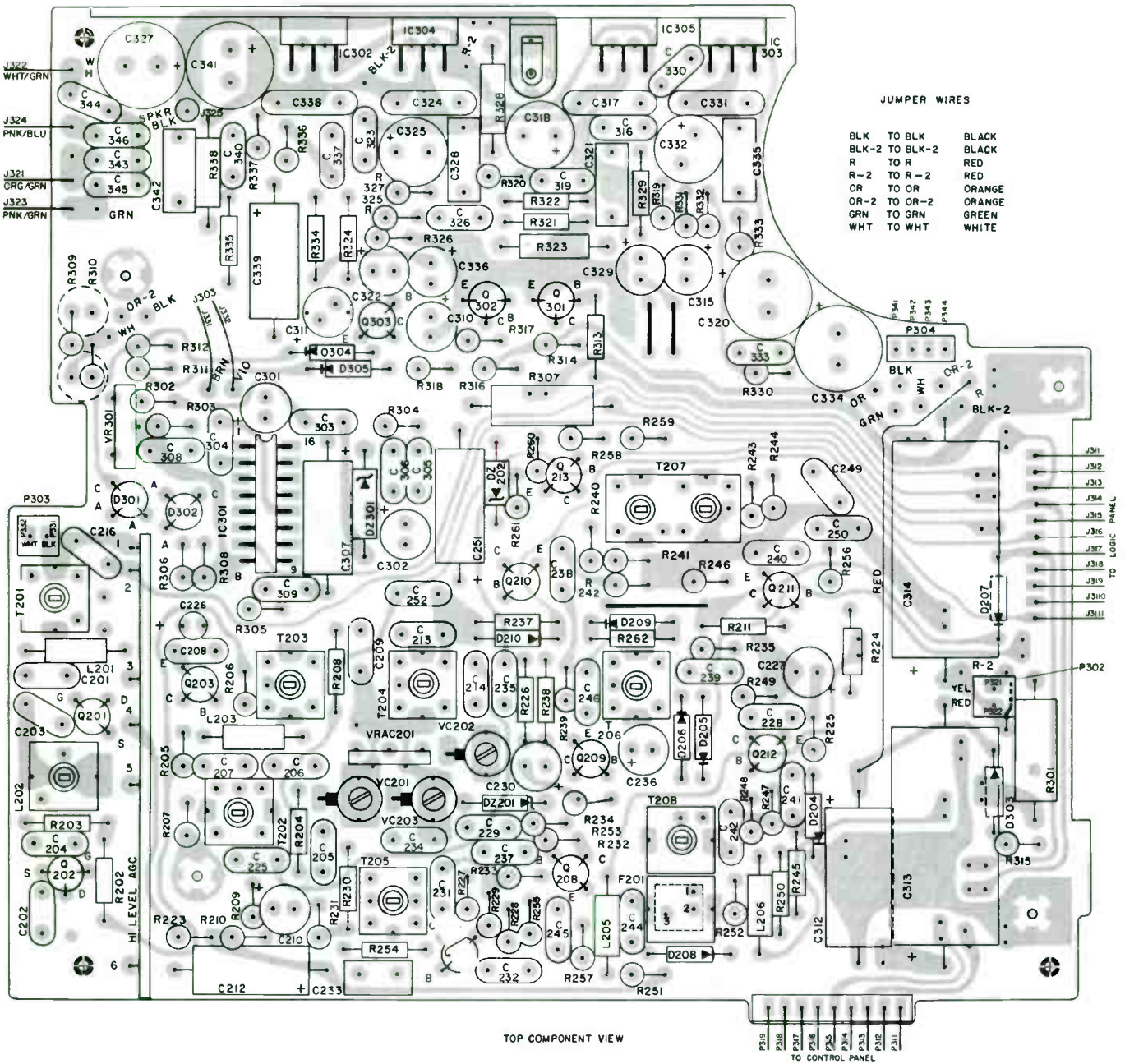
BOTTOM COPPER VIEW

AGC PANEL

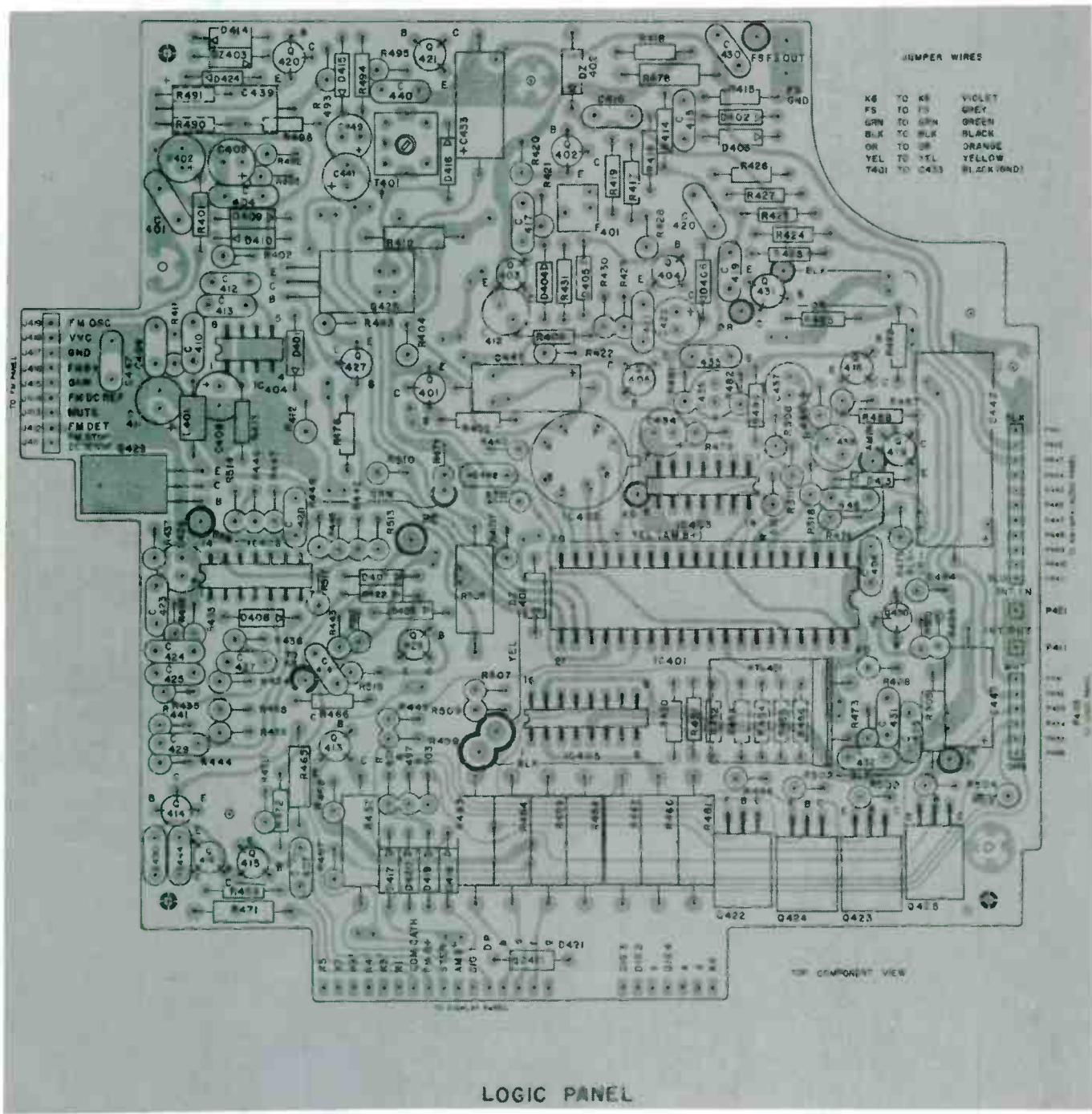


BOTTOM COPPER VIEW

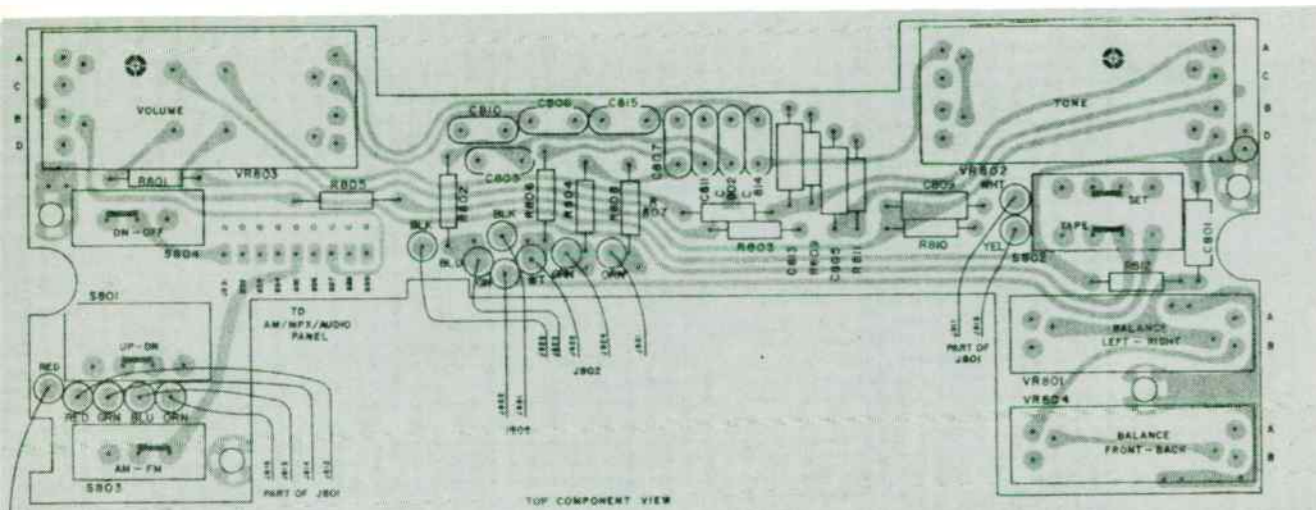
FM PANEL



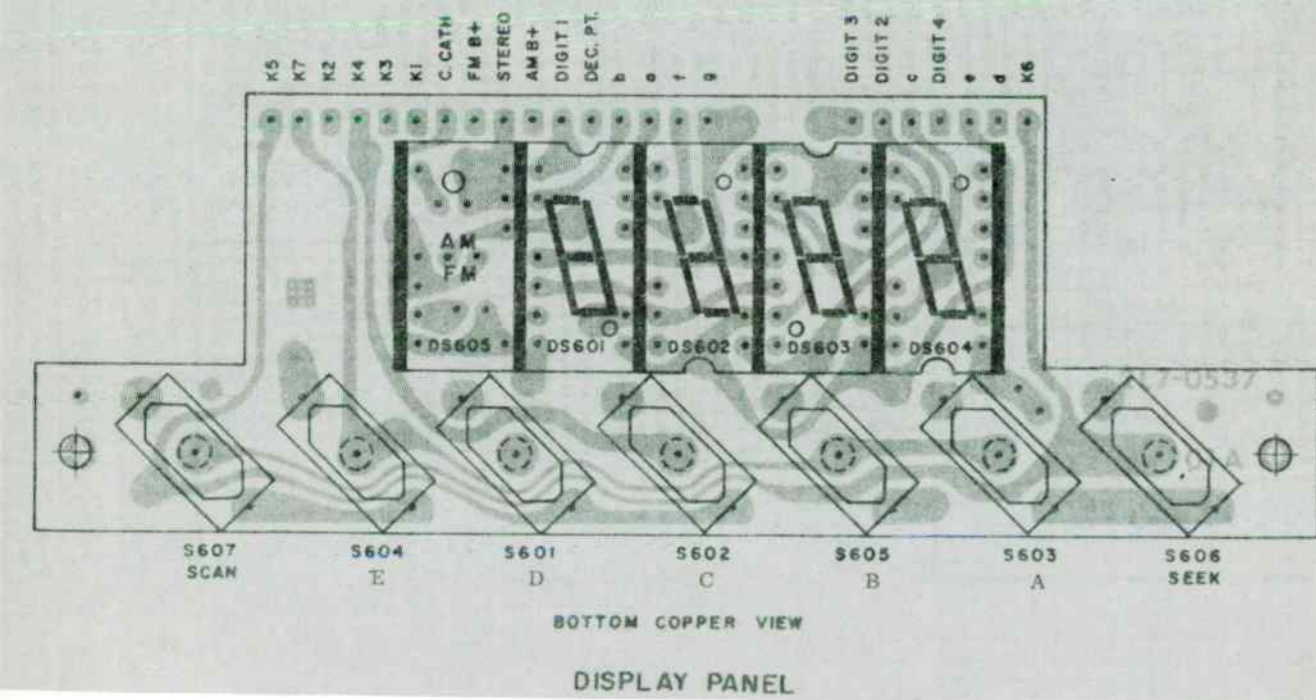
AM/MPX/AUDIO PANEL



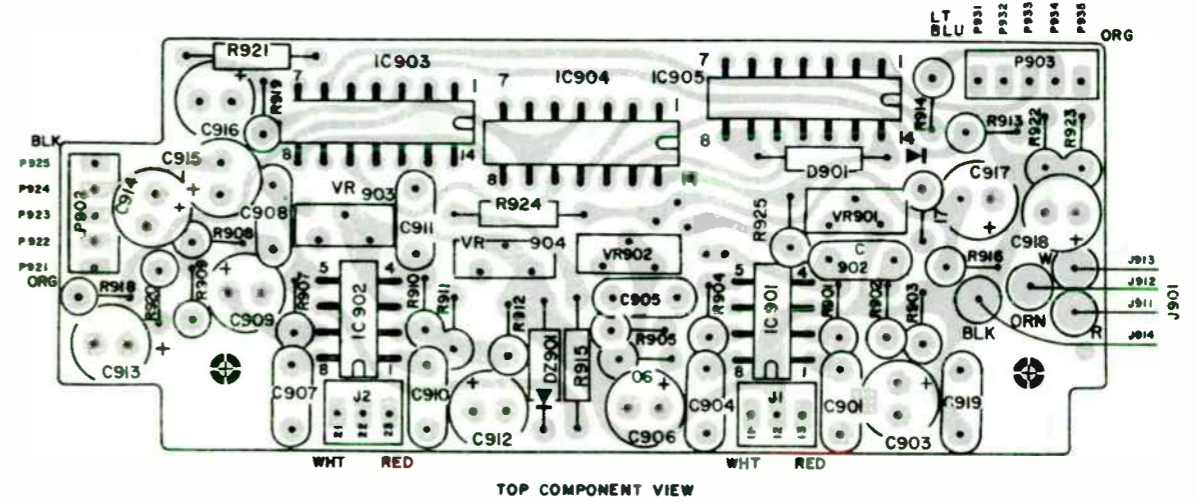
LOGIC PANEL



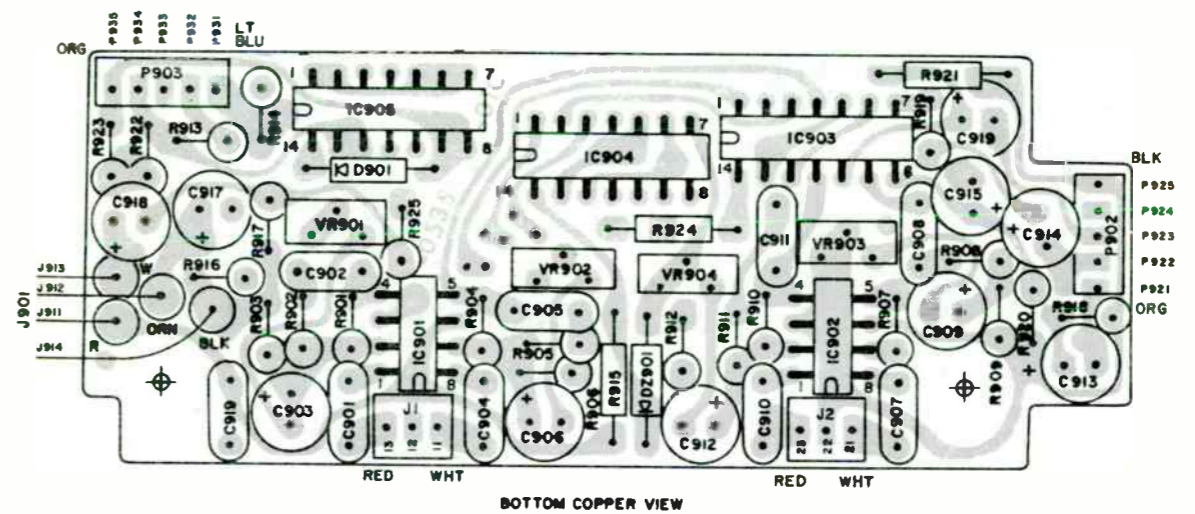
CONTROL PANEL



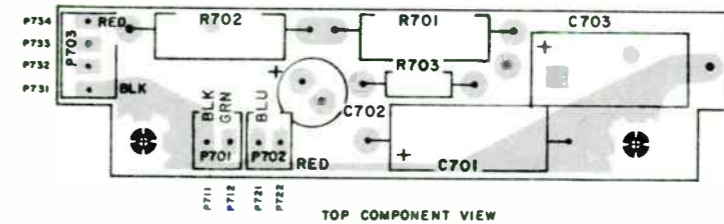
BOTTOM COPPER VIEW
DISPLAY PANEL



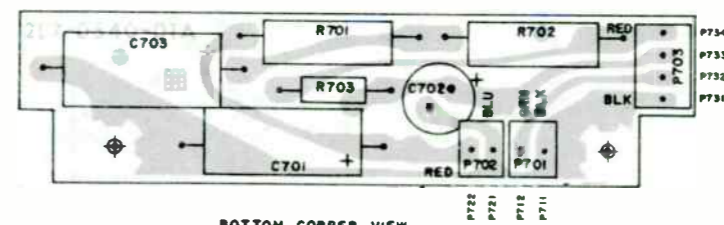
TOP COMPONENT VIEW



BOTTOM COPPER VIEW



TOP COMPONENT VIEW



BOTTOM COPPER VIEW

PRE-AMP AND MOTOR FILTER PANELS-
TOP AND BOTTOM VIEWS

Ford D9LF18B826AE

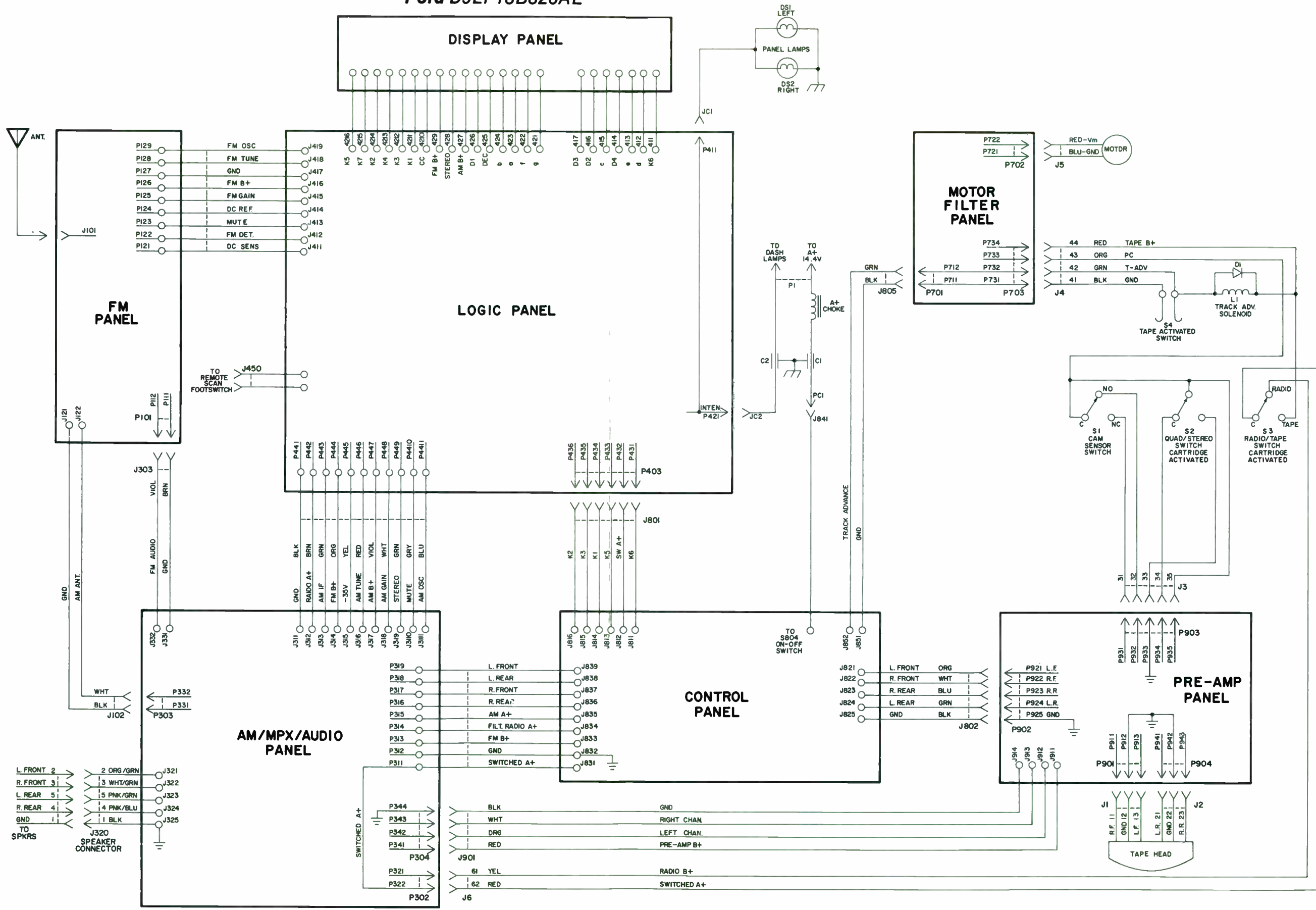
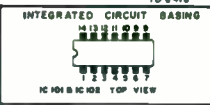
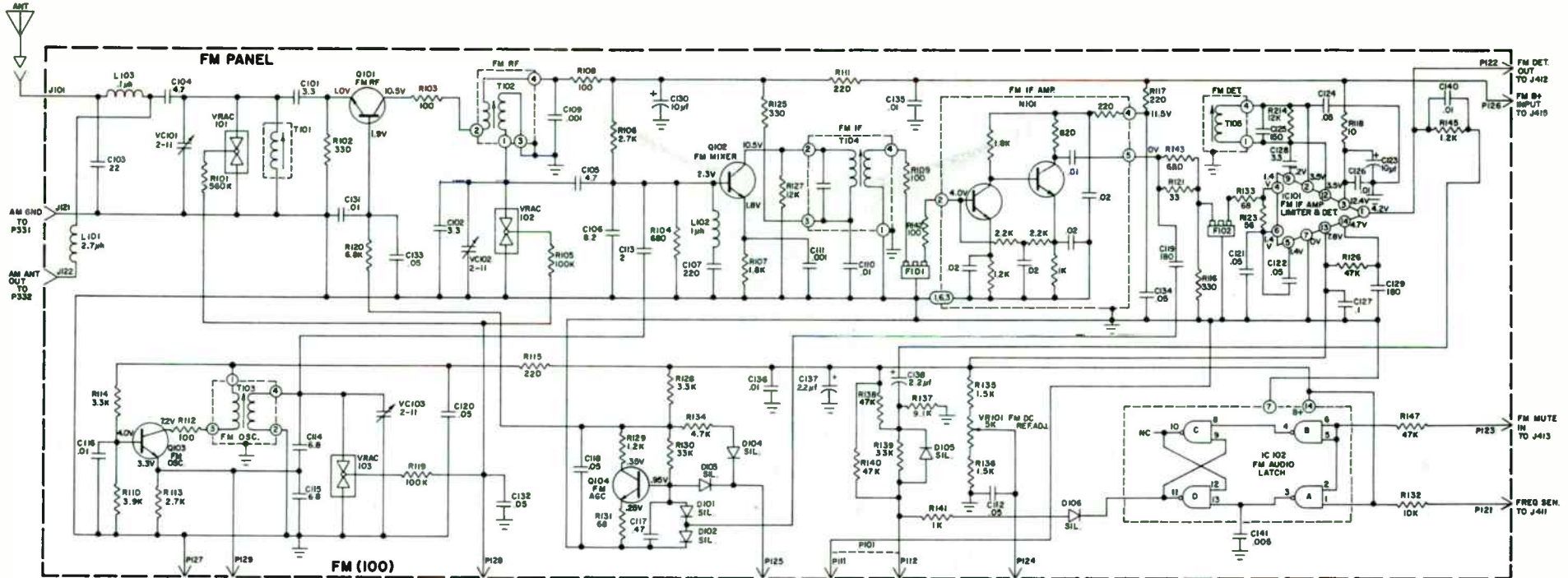


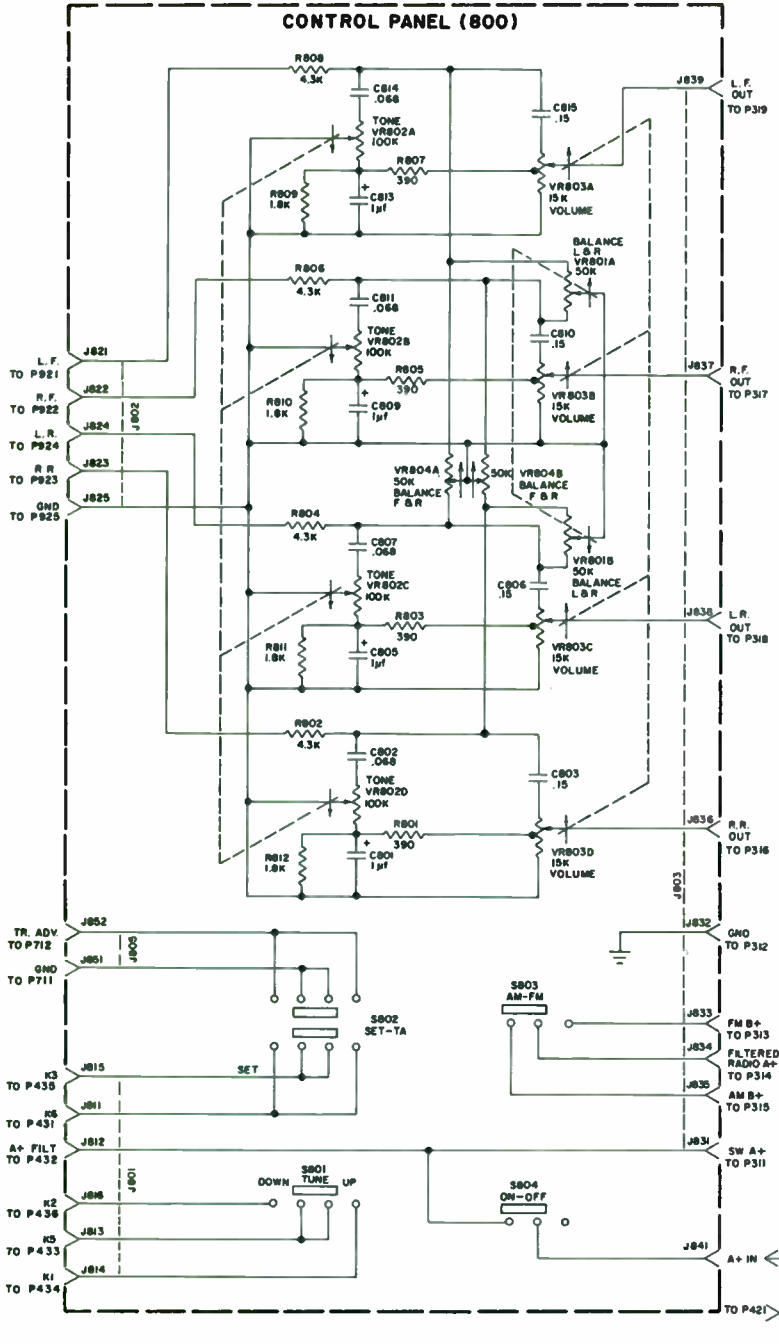
FIGURE 17. ELECTRICAL INTERCONNECTION DIAGRAM



1. ALL VOLTAGES MEASURED WITH A HI-IMPEDANCE VTVM UNDER NO SIGNAL CONDITIONS AND +14.0V. A+ SUPPLY WITH RADIO SET FOR F.M.B VOL. CONTROL SET TO MIN. EXCEPT WHERE OTHERWISE NOTED.
2. ALL RESISTORS ARE 1/4 WATT ±5% (EXCEPT WHERE OTHERWISE NOTED). RESISTANCE ARE IN OHMS.
3. CAPACITANCE (UNLESS OTHERWISE SPECIFIED) VALUES LESS THAN ONE ARE IN MICROFARADS. VALUES ABOVE ONE ARE IN PICOFARADS.
4. CONNECTORS NUMBERING SYSTEM:
FIRST DIGIT INDICATES P.W. PANEL.
SECOND DIGIT INDICATES CONNECTOR NUMBER.
LAST DIGITS INDICATE PIN NUMBER.(S)
5. TUNING RANGE - AM 530 KHZ TO 1600 KHZ (I.F. 455 KHZ TUNING RANGE - FM 88.1 MHZ TO 107.9 MHZ (I.F. 10.7 MHZ)
6. * COMPONENT SUBJECT TO CHANGE.
7. ⚡ GROUND (RADIO CHASSIS OR HOUSING).
8. ⚡ GROUND (P.W. PANEL).

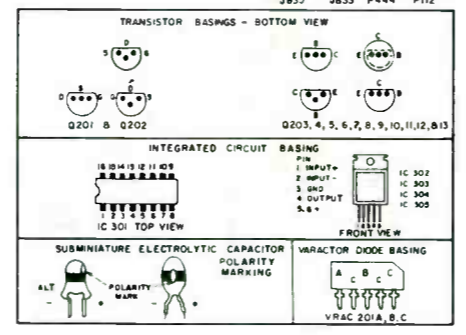
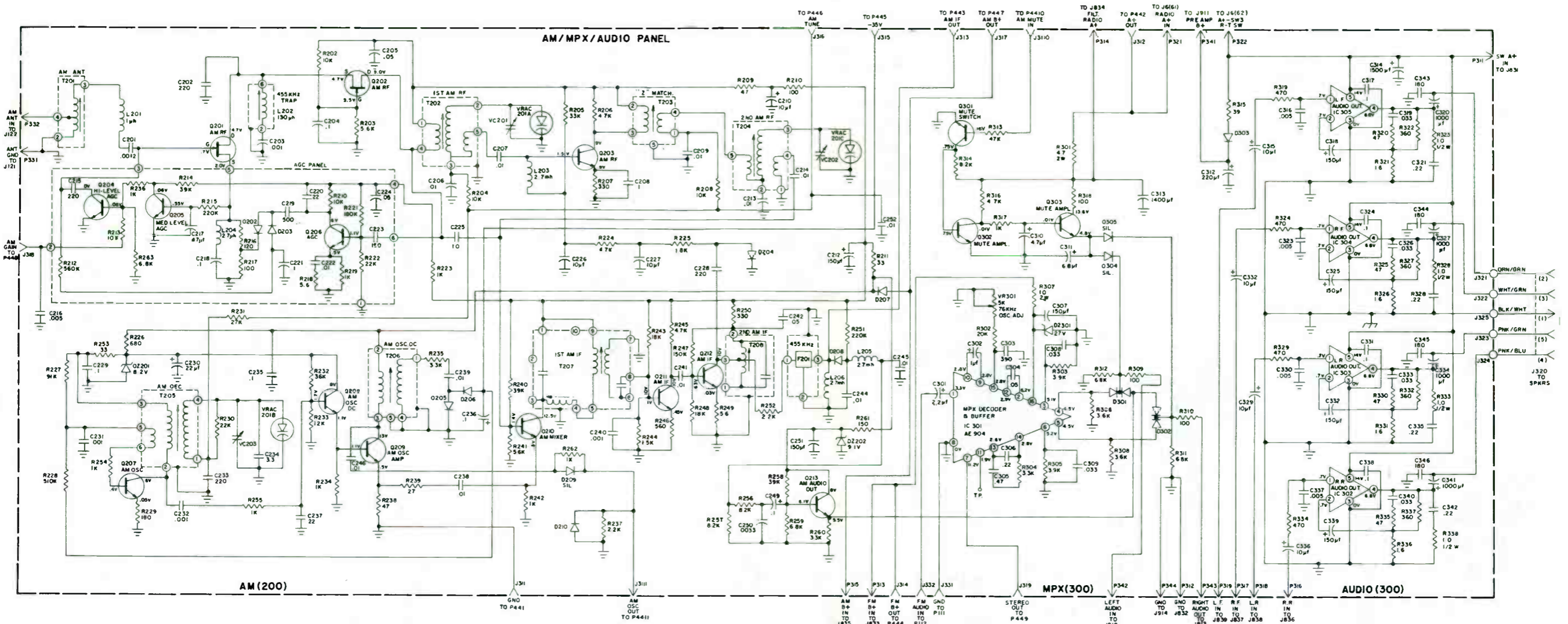
FM PANEL - SCHEMATIC DIAGRAM

Ford D9LF18B826AE

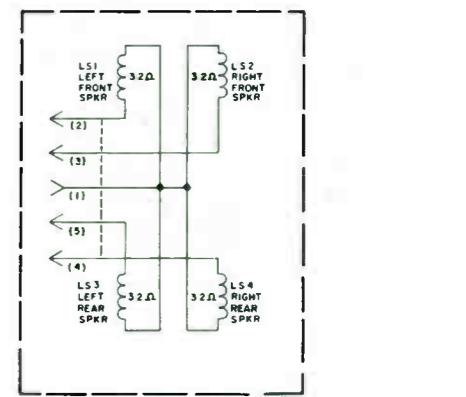


- NOTES**
1. ALL RESISTORS ARE 1/4 WATT $\pm 5\%$ (EXCEPT WHERE OTHERWISE NOTED). RESISTANCE ARE IN OHMS.
 2. CAPACITANCE (UNLESS OTHERWISE SPECIFIED) VALUES LESS THAN ONE ARE IN MICROFARADS. VALUES ABOVE ONE ARE IN PICOFARADS.
 3. CONNECTORS NUMBERING SYSTEM: FIRST DIGIT INDICATES P.W. PANEL, SECOND DIGIT INDICATES CONNECTOR NUMBER, LAST DIGITS INDICATE PIN NUMBER(S)
 4. * COMPONENT SUBJECT TO CHANGE.
 5. $\text{---}\text{---}\text{---}$ GROUND (RADIO CHASSIS OR HOUSING).
 6. $\text{---}\text{---}\text{---}$ GROUND (P.W. PANEL).
 7. THE METALLIC CASE OF ALL VARIABLE RESISTORS ON THE MANUAL CONTROLS PANEL ARE CONNECTED TO THE CHASSIS GROUND. ($\text{---}\text{---}\text{---}$)

FIGURE 28. CONTROL PANEL - SCHEMATIC DIAGRAM

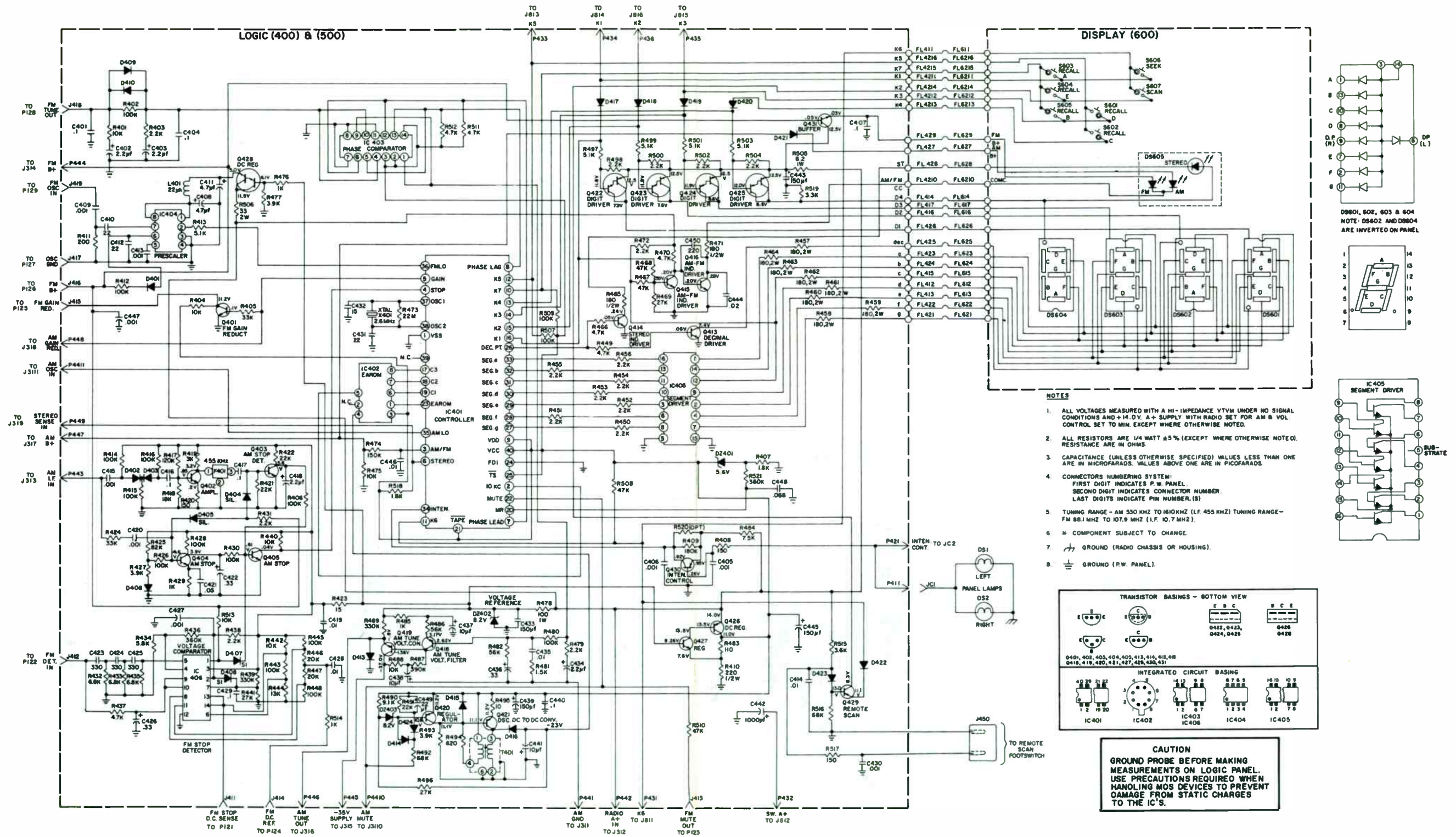


- NOTES**
1. ALL VOLTAGES MEASURED WITH A HI-IMPEDANCE VTVM UNDER NO SIGNAL CONDITIONS AND +14.0V A+ SUPPLY WITH RADIO SET FOR AM B VOL. CONTROL SET TO MIN. EXCEPT WHERE OTHERWISE NOTED.
 2. ALL RESISTORS ARE 1/4 WATT ±5% (EXCEPT WHERE OTHERWISE NOTE) RESISTANCE ARE IN OHMS.
 3. CAPACITANCE (UNLESS OTHERWISE SPECIFIED) VALUES LESS THAN ONE ARE IN MICROFARADS. VALUES ABOVE ONE ARE IN PICOFARADS.
 4. CONNECTORS NUMBERING SYSTEM: FIRST DIGIT INDICATES P.W. PANEL. SECOND DIGIT INDICATES CONNECTOR NUMBER. LAST DIGITS INDICATE PIN NUMBER (S).
 5. TUNING RANGE-AM 530 KHZ TO 1610 KHZ (IF 455 KHZ) TUNING RANGE-FM 88.1 MHZ TO 107.9 MHZ (LF 10.7 MHZ).
 6. * COMPONENT SUBJECT TO CHANGE
 7. ⏏ GROUND (RADIO CHASSIS OR HOUSING).
 8. ⏏ GROUND (P.W. PANEL).



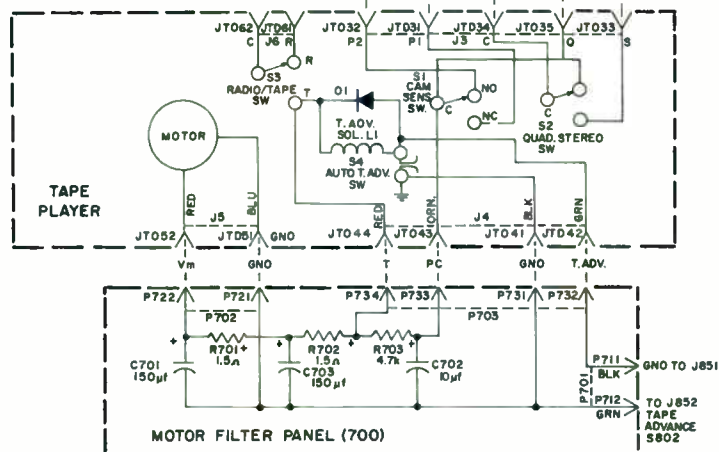
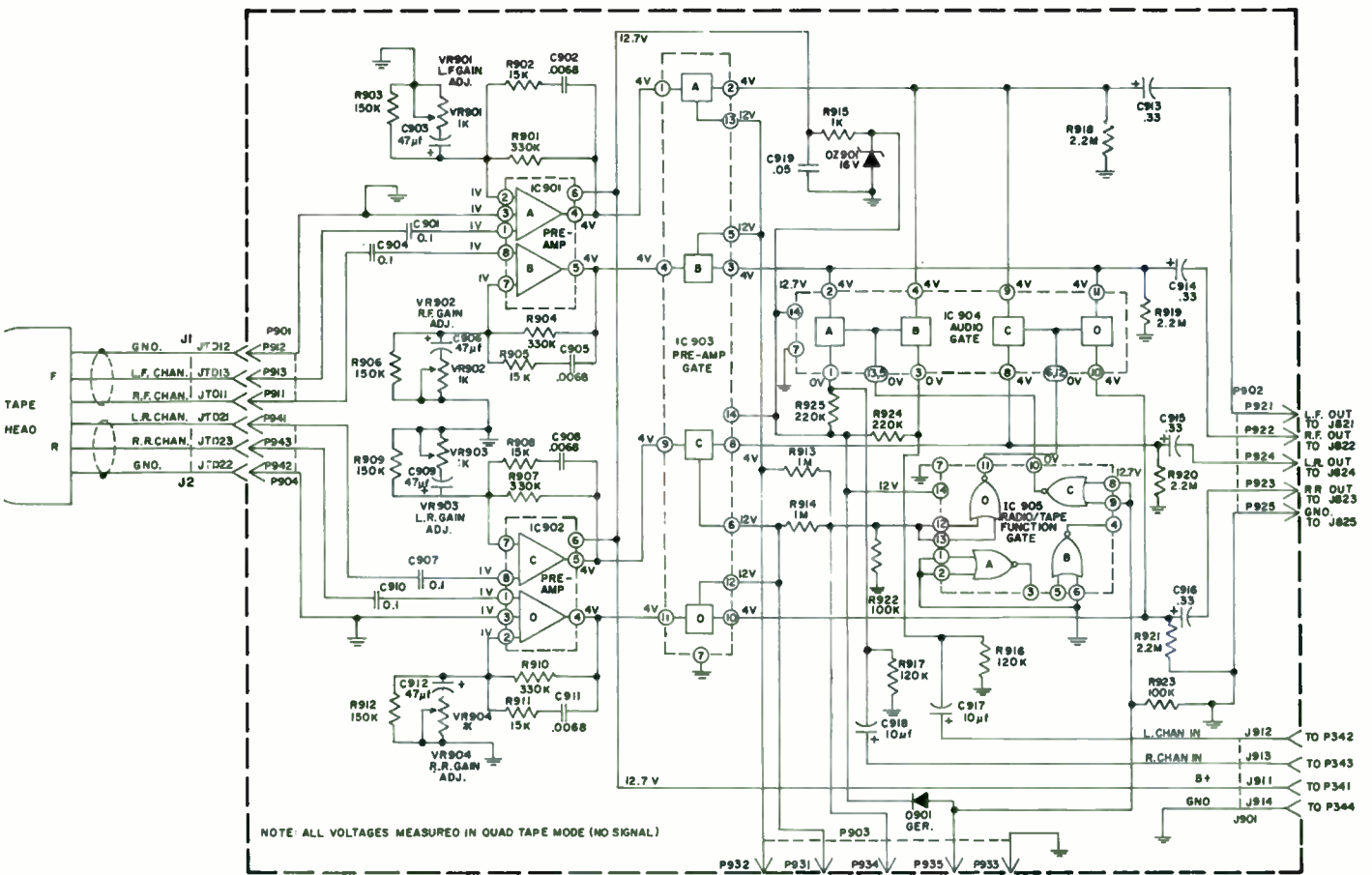
AM/MPX/AUDIO PANEL - SCHEMATIC DIAGRAM

Ford D9LF18B826AE



LOGIC AND DISPLAY PANELS - SCHEMATIC DIAGRAM

PRE AMP PANEL (900)



PRE-AMP AND MOTOR FILTER PANELS- SCHEMATIC DIAGRAM

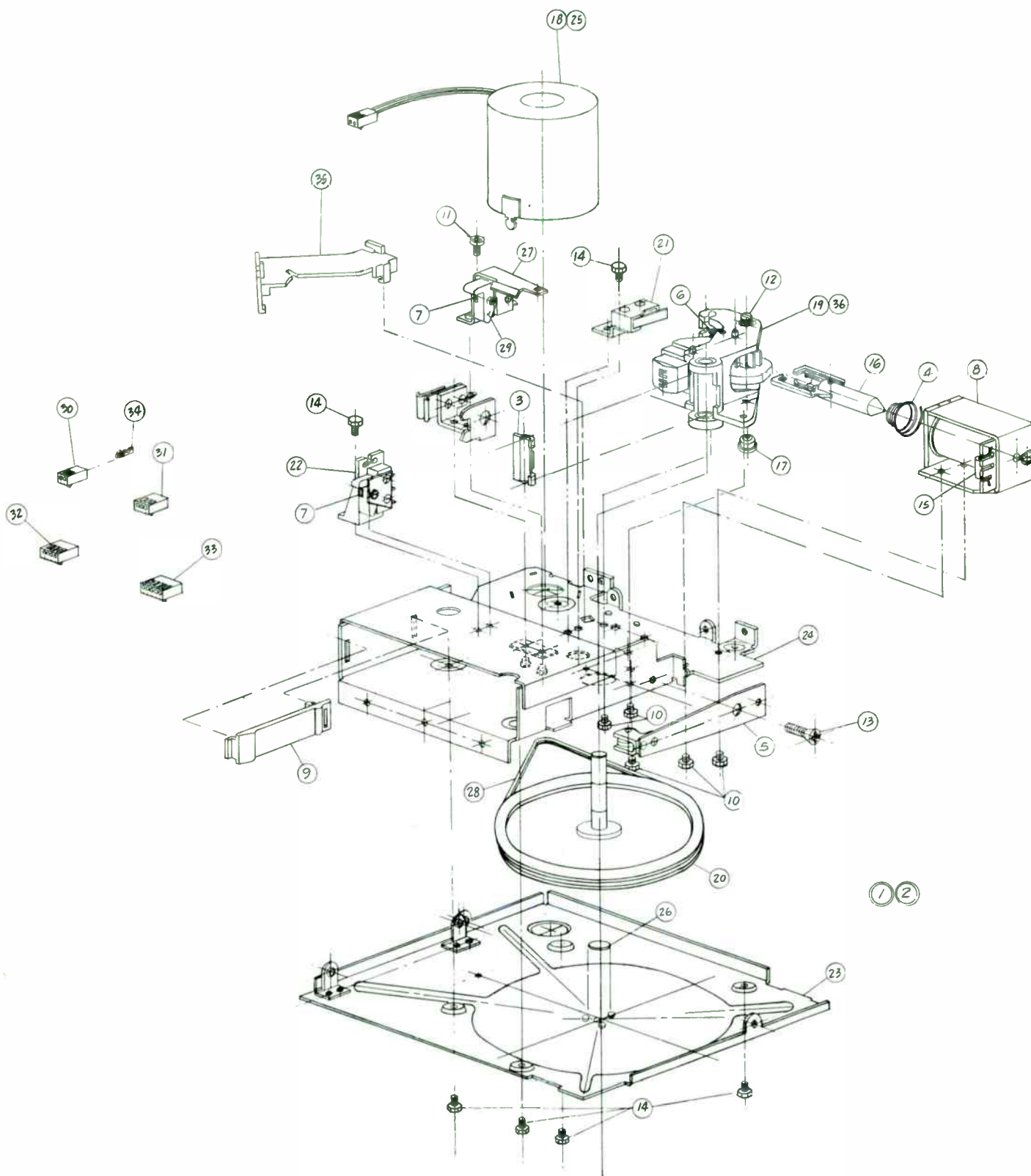
ELECTRICAL PARTS LIST

AM/FM STEREO RADIO/QUAD TAPE PLAYER MODEL D9LF

New parts not previously carried are indicated by the symbol "#" following the number.

SYM-BOL	*W A R R.	DESCRIPTION	SERVICE PART NO.	SYM-BOL	*W A R R.	DESCRIPTION	SERVICE PART NO.
CAPACITORS							
C1	C	1000 pf, A+ feedthru, radio	7L6-0536-2#	C212	C	150 mfd/16V, AM B+ filter	3L0-0009-45
C2	C	1000 pf, A+ feedthru, pilot lamps	7L6-0536-3#	C213	C	.01 mfd/50V, AM RF bypass	3L0-0007-72
C101	C	3.3 pf/500V, RF input	3L0-0006-13	C214	C	.01 mfd/16V, AM RF cplg.	3L0-0008-21
C102	C	3.3 pf/500V, RF filter	3L0-0006-13	C215	C	220 pf/500V, AGC cplg.	3L0-0007-15
C103	C	22 pf/500V, RF comp.	3L0-0007-13	C216	C	.005 mfd/50V, AM AGC filter	3L0-0007-38
C104	C	4.7 pf/500V, RF input	3L0-0006-17	C217	C	4.7 mfd/10V, AGC filter	3L0-0011-13
C105	C	4.7 pf/500V, Mixer input	3L0-0006-17	C218	C	.1 mfd/10V, RF tank	3L0-0008-11
C106	C	8.2 pf/500V, Mixer input div.	3L0-0006-20	C219	C	500 pf/150V, AGC cplg.	3L0-0006-23
C107	C	220 pf/500V, 10.7 MHz trap	3L0-0007-15	C220	C	22 pf/500V, AGC cplg.	3L0-0007-13
C109	C	.001 mfd/50V, B+ bypass	3L0-0007-37	C221	C	.1 mfd/16V, AGC filter	3L0-0008-38
C110	C	.01 mfd/16V, B+ bypass	3L0-0008-21	C222	C	.01 mfd/16V, Q206 emit.	3L0-0008-21
C111	C	.001 mfd/50V, Mixer emit bypass	3L0-0007-37	C223	C	150 pf/50V, AGC cplg.	3L0-0007-49
C112	C	.05 mfd/10V, DC ref. filter	3L0-0008-10	C224	C	.05 mfd/16V, AGC B+ filter	3L0-0008-41
C113	C	2 pf/500V, FM osc. cplg.	3L0-0006-52	C225	C	10 pf/500V, Mixer cplg.	3L0-0007-14
C114	C	6.8 pf/500V, FM osc. tank	3L0-0006-16	C226	C	10 mfd/20V, AGC filter	3L0-0011-4
C115	C	68 pf/100V, FM osc. tank	3L0-0010-20	C227	C	10 mfd/20V, AGC filter	3L0-0011-4
C116	C	.01 mfd/16V, FM osc. base	3L0-0008-21	C228	C	220 pf/500V, AGC cplg.	3L0-0007-15
C117	C	.47 mfd/3V, AGC filter	3L0-0008-14	C229	C	.1 mfd/10V, Osc. B+ filter	3L0-0008-11
C118	C	.05 mfd/10V, AGC filter	3L0-0008-10	C230	C	22 mfd/15V, B+ filter	3L0-0011-26
C119	C	180 pf/500V, AGC cplg.	3L0-0007-36	C231	C	.001 mfd/50V, Q207 bias filter	3L0-0007-37
C120	C	.05 mfd/10V, Osc. B+ filter	3L0-0008-10	C232	C	.001 mfd/50V, Osc. cplg.	3L0-0007-37
C121	C	.05 mfd/10V, IC101 bypass	3L0-0008-10	C233	C	230 pf/50V, AM tune volt. filter	3L0-0010-23#
C122	C	.05 mfd/10V, IC101 bypass	3L0-0008-10	C234	C	3.3 pf/500V, VRAC 201B comp.	3L0-0006-13
C123	C	10 mfd/20V, B+ filter	3L0-0011-4	C235	C	.1 mfd/16V, B+ filter	3L0-0008-38
C124	C	.05 mfd/10V, FM det. filter	3L0-0008-10	C236	C	.1 mfd/50V, Filter -35V supply	3L0-0011-38#
C125	C	150 pf/50V, N330, FM det. tank	3L0-0006-74#	C237	C	22 pf/500V, Q208 base	3L0-0007-13
C126	C	.01 mfd/16V, B+ filter	3L0-0008-21	C238	C	.01 mfd/16V, Mixer cplg.	3L0-0008-21
C127	C	.1 mfd/10V, DC ref. filter	3L0-0008-11	C239	C	.01 mfd/50V, Filter, -35V supply	3L0-0007-72
C128	C	3.3 pf/500V, FM det. cplg.	3L0-0006-13	C240	C	.001 mfd/50V, Q211 base	3L0-0007-37
C129	C	180 pf/500V, DC ref. filter	3L0-0007-36	C241	C	.01 mfd/16V, AM IF cplg.	3L0-0008-21
C130	C	10 mfd/16V, B+ filter	3L0-0030-6#	C242	C	.05 mfd/16V, IF B+ filter	3L0-0008-41
C131	C	.01 mfd/16V, AGC filter	3L0-0008-21	C244	C	.01 mfd/16V, AM audio filter	3L0-0008-21
C132	C	.05 mfd/25V, FM tune voltage filter	3L0-0008-39	C245	C	.01 mfd/16V, AM audio filter	3L0-0008-21
C133	C	.05 mfd/10V, AGC filter	3L0-0008-10	C246	C	.01 mfd/50V, AM osc. freq. out	3L0-0007-72
C134	C	.05 mfd/25V, B+ filter	3L0-0008-39	C249	C	.1 mfd/12V, AM audio cplg.	3L0-0008-67#
C135	C	.01 mfd/16V, B+ filter	3L0-0008-21	C250	C	.0033 mfd/50V, AM audio filter	3L0-0007-66
C136	C	.01 mfd/16V, B+ filter	3L0-0008-21	C251	C	150 mfd/16V, B+ filter	3L0-0009-45
C137	C	2.2 mfd/20V, B+ filter	3L0-0011-28	C252	C	.01 mfd/50V, AM tune volt. filter	3L0-0007-72
C138	C	2.2 mfd/20V, FM audio cplg.	3L0-0011-28	C301	C	2.2 mfd/10V, MPX decoder input	3L0-0011-20
C140	C	.01 mfd/16V, FM audio cplg.	3L0-0008-21	C302	C	1 mfd/35V, IC301 cplg.	3L0-0011-3
C141	C	.005 mfd/50V, IC102 bypass	3L0-0007-38	C303	C	390 pf/100V, 75 KHz osc.	3L0-0010-17
C201	C	.0012 mfd/500V, RF input	3L0-0007-20	C304	C	.05 mfd/16V, IC301 cplg.	3L0-0008-41
C202	C	220 pf/500V, Q201 bypass	3L0-0007-15	C305	C	.47 mfd/3V, DC filter	3L0-0008-14
C203	C	.001 mfd/100V, 455 KHz trap	3L0-0007-52	C306	C	.22 mfd/3V, DC filter	3L0-0008-30
C204	C	.1 mfd/10V, Q202 gate filter	3L0-0008-11	C307	C	150 mfd/16V, IC301 B+ filter	3L0-0009-45
C205	C	.05 mfd/16V, Q202 gate filter	3L0-0008-41	C308	C	.033 mfd/12V, De-emphasis L. chan.	3L0-0008-32
C206	C	.01 mfd/50V, AM tune volt. filter	3L0-0007-72	C309	C	.033 mfd/12V, De-emphasis R. chan.	3L0-0008-32
C207	C	.01 mfd/50V, RF coupler	3L0-0007-72	C310	C	4.7 mfd/20V, Q303 base	3L0-0011-40
C208	C	.1 mfd/10V, Q203 emit bypass	3L0-0008-11	C311	C	68 mfd/16V, Mute filter	3L0-0030-20
C209	C	.01 mfd/50V, AM tune volt. filter	3L0-0007-72	C312	C	220 mfd/16V, Pre-amp B+ filter	3L0-0009-53
C210	C	10 mfd/20V, AM B+ filter	3L0-0011-4				

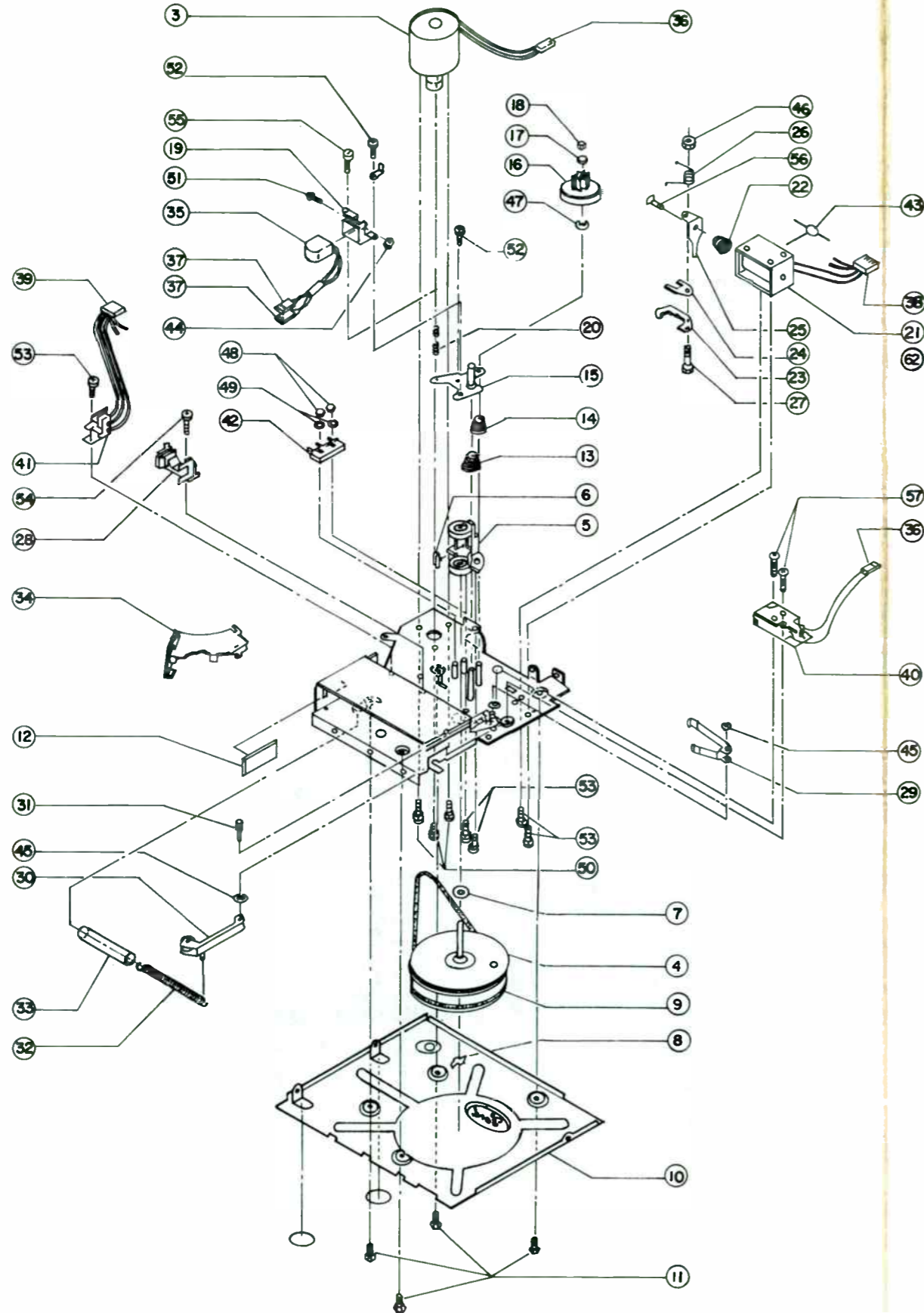
*Warranty Component Category



7L6-0844-15	35	WIRE DRESS CLAMP
2L8-0753-01	34	TERMINAL
2L7-0499-05	33	TERMINAL HOUSING 5 CIR.
2L7-0499-04	32	TERMINAL HOUSING 4 CIR.
2L7-0499-03	31	TERMINAL HOUSING 3 CIR.
2L7-0499-02	30	TFRMINAL HOUSING 2 CIR.
7L6-0495-63	29	ACTUATOR, SWITCH
7L6-0844-14	28	BELT, DRIVE
7L6-0495-62	27	BRACKET ASS'Y ACTUATOR BRKT SHAFT & SWITCH
7L6-0495-52	26	BUTTON, THRUST
	25	
7L6-0844-13	24	CHASSIS ASS'Y. CHASSIS & GUIDE
7L6-0844-12	23	COVER, BOTTOM
7L6-0844-11	22	NOTCH SENSOR SWITCH ASS'Y
7L6-0844-10	21	CAM SENSOR SWITCH ASS'Y
7L6-0844-09	20	FLYWHEEL ASS'Y
7L6-0844-08	19	HOUSING ASS'Y TAPE HEAD, CAM BRKT & BUSHING ASS'Y
7L6-0844-07	18	MOTOR AND CABLE ASS'Y
7L6-0495-28	17	NUT, PLASTIC, CAM ADJUST
7L6-0844-06	16	PLUNGER ASS'Y
7L6-0495-14	15	RECTIFIER, SILICON
7L6-0495-23	14	SCREW, CHASSIS ASS'Y MTG.
7L6-0844-05	13	SCREW, CARTRIDGE LOCK
7L6-0495-50	12	SCREW, ADJUST CAM
7L6-0844-04	11	SCREW, ACTUATOR BRKT. TO GUIDE
7L6-0844-03	10	SCREW, HOUSING & SOLENOID MTG.
7L6-0495-42	9	SLIDE, CARTRIDGE GUIDE
7L6-0844-02	8	SOLENOID ASS'Y
7L6-0495-64	7	SPRING, ACTUATOR
7L6-0844-01	6	SPRING, CARRIAGE
7L6-0495-43	5	SPRING, CARTRIDGE LOCK
7L6-0495-46	4	SPRING, CONICAL SOL. PLUNGER
7L6-0495-82	3	STRIPPER, TAPE
	2	
7L6-0721-01	1	TAPE MECHANISM ASS'Y
PART NO.	ITEM	DESCRIPTION

QUAD. TAPE MECHANISM TYPE I-EXPLODED VIEW

Ford D9LF18B826AE



7L6 - 0845 - 56	62	PLUNGER
7L6 - 0845 - 51	57	SCREW, BIND 3mm X 12mm
7L6 - 0845 - 50	56	SCREW, PLATE 3mm X 8mm
7L6 - 0845 - 49	55	SCREW, FLAT 3mm X 10mm
7L6 - 0845 - 48	54	SCREW, W/WASHER 3mm X 6mm
7L6 - 0845 - 47	53	SCREW, W/WASHER 3mm X 6mm
7L6 - 0845 - 46	52	SCREW, W/WASHER 3mm X 5mm
7L6 - 0845 - 45	51	SCREW, W/WASHER 2.6mm X 8mm
7L6 - 0845 - 44	50	SCREW, W/WASHER 3mm X 4mm
7L6 - 0845 - 43	49	WASHER, SPRING 2mm
7L6 - 0845 - 42	48	NUT HEXAGON 2mm
7L6 - 0845 - 41	47	E-RING
7L6 - 0845 - 40	46	NUT HEXAGON 3mm
7L6 - 0845 - 39	45	E-RING 3mm
7L6 - 0845 - 38	44	NUT, HEXAGON 3mm
7L6 - 0495 - 14	43	RECTIFIER, SILICON DIODE
7L6 - 0845 - 36	42	SWITCH CAM SENSOR
7L6 - 0845 - 35	41	SWITCH NOTCH SENSOR
7L6 - 0845 - 34	40	SWITCH RADIO-TAPE
2L7 - 0499 - 05	39	TERMINAL HOUSING 5 CIR
2L7 - 0499 - 04	38	TERMINAL HOUSING 4 CIR
2L7 - 0499 - 03	37	TERMINAL HOUSING 3 CIR
2L7 - 0499 - 02	36	TERMINAL HOUSING 2 CIR
7L6 - 0845 - 37	35	PLAYBACK HEAD
7L6 - 0844 - 15	34	WIRE DRESS CLAMP
7L6 - 0845 - 33	33	TUBE
7L6 - 0845 - 32	32	SPRING, PRESSURE ARM
7L6 - 0845 - 31	31	SHAFT, PRESSURE ARM
7L6 - 0845 - 30	30	PRESSURE ARM ASS'Y
7L6 - 0845 - 29	29	ACTUATOR
7L6 - 0845 - 28	28	TAPE GUIDE
7L6 - 0845 - 27	27	SHAFT, SENDING CLAW
7L6 - 0845 - 26	26	SPRING, SENDING CLAW
7L6 - 0845 - 25	25	GUIDE PLATE
7L6 - 0845 - 24	24	SENDING CLAW 2
7L6 - 0845 - 23	23	SENDING CLAW 1
7L6 - 0845 - 22	22	SPRING, PLUNGER
7L6 - 0845 - 21	21	PLUNGER & SOLENOID
7L6 - 0845 - 20	20	SPRING, AZIMUTH
7L6 - 0845 - 19	19	MOUNTING BRKT HEAD
7L6 - 0845 - 18	18	LOCKNUT
7L6 - 0845 - 17	17	POLYSLIDER
7L6 - 0845 - 16	16	CAM
7L6 - 0845 - 15	15	HEAD MOVING PLATE ASS'Y
7L6 - 0845 - 14	14	SPRING
7L6 - 0845 - 13	13	SPRING
7L6 - 0845 - 12	12	CARTRIDGE GUIDE
7L6 - 0845 - 11	11	SCREW CHASSIS ASS'Y MTG
7L6 - 0845 - 10	10	BOTTOM COVER
7L6 - 0845 - 09	9	RUBBER BELT
7L6 - 0845 - 08	8	THRUST SHEET
7L6 - 0845 - 07	7	POLYSLIDER
7L6 - 0845 - 06	6	CAPSTAN SHOE
7L6 - 0845 - 05	5	CAPSTAN BLOCK
7L6 - 0845 - 04	4	FLYWHEEL ASS'Y
7L6 - 0845 - 03	3	MOTOR & CABLE ASS'Y
	2	
7L6 - 0811 - 01	1	TAPE MECHANISM ASS'Y
PART NO.	ITEM	DESCRIPTION

QUAD. TAPE MECHANISM TYPE 2-EXPLODED VIEW

ELECTRICAL PARTS LIST (Cont'd)
AM/FM STEREO RADIO/QUAD TAPE PLAYER MODEL D9LF

Ford D9LF18B826AE

New parts not previously carried are indicated by the symbol "*" following the number.

SYM-BOL	*W A R R.	DESCRIPTION	SERVICE PART NO.
C313	C	1400 mfd/16V, Mute B+ filter	3L0-0009-23
C314	C	1500 mfd/16V, Switched A+ filter	3L0-0029-11*
C315	C	10 mfd/20V, L. F. audio cplg.	3L0-0011-10
C316	C	.005 mfd/100V, L. F. audio filter	3L0-0007-22
C317	C	.1 mfd/50V, B+ filter	3L0-0008-71
C318	C	150 mfd/16V, DC feedback	3L0-0030-11*
C319	C	.033 mfd/12V, Feedback cplg.	3L0-0008-32
C320	C	1000 mfd/10V, L. F. output	3L0-0030-18*
C321	C	.22 mfd/50V, Audio stabilizer	3L0-1001-34
C322	C	10 mfd/20V, R. F. audio cplg.	3L0-0011-10
C323	C	.005 mfd/100V, R. F. audio filter	3L0-0007-22
C324	C	.1 mfd/50V, B+ filter	3L0-0008-71
C325	C	150 mfd/16V, DC feedback	3L0-0030-11*
C326	C	.033 mfd/12V, Feedback cplg.	3L0-0008-32
C327	C	1000 mfd/10V, R. F. output	3L0-0030-18*
C328	C	.22 mfd/50V, Audio stabilizer	3L0-1001-34
C329	C	10 mfd/20V, L. R. audio cplg.	3L0-0011-10
C330	C	.005 mfd/100V, L. R. audio filter	3L0-0007-22
C331	C	.1 mfd/50V, B+ filter	3L0-0008-71
C332	C	150 mfd/16V, DC feedback	3L0-0030-11*
C333	C	.033 mfd/12V, Feedback cplg.	3L0-0008-32
C334	C	1000 mfd/10V, L. R. output	3L0-0030-18*
C335	C	.22 mfd/50V, Audio stabilizer	3L0-1001-34
C336	C	10 mfd/20V, R. R. audio cplg.	3L0-0011-10
C337	C	.005 mfd/100V, R. R. audio filter	3L0-0007-22
C338	C	.1 mfd/50V, B+ filter	3L0-0008-71
C339	C	150 mfd/16V, DC feedback	3L0-0009-50
C340	C	.033 mfd/12V, Feedback cplg.	3L0-0008-32
C341	C	1000 mfd/10V, R. R. output	3L0-0030-18*
C342	C	.22 mfd/50V, Audio stabilizer	3L0-1001-34
C343	C	180 pf/500V, Audio filter	3L0-0007-36
C344	C	180 pf/500V, Audio filter	3L0-0007-36
C345	C	180 pf/500V, Audio filter	3L0-0007-36
C346	C	180 pf/500V, Audio filter	3L0-0007-36
C401	C	.1 mfd/16V, FM tune volt.	3L0-0008-38
C402	C	2.2 mfd/20V, FM tune supply	3L0-0011-28
C403	C	2.2 mfd/20V, FM tune supply	3L0-0011-28
C404	C	.1 mfd/16V, FM tune supply	3L0-0008-38
C405	C	.001 mfd/50V, Q430 coll.	3L0-0007-37
C406	C	.001 mfd/50V, Q430 base	3L0-0007-37
C407	C	.1 mfd/16V, FM ind. B+	3L0-0008-38
C408	C	4.7 mfd/10V, IC404 pin #1 & #8	3L0-0011-13
C409	C	.001 mfd/50V, IC404 FM input	3L0-0007-37
C410	C	22 pf/500V, IC404 pin #7	3L0-0007-13
C411	C	4.7 mfd/10V, Q428 emit.	3L0-0011-13
C412	C	22 pf/500V, IC404 pin #6	3L0-0007-13
C413	C	.001 mfd/50V, IC404 pin #5	3L0-0007-37

SYM-BOL	*W A R R.	DESCRIPTION	SERVICE PART NO.
C414	C	.01 mfd/16V, Remote scan input	3L0-0008-21
C415	C	.001 mfd/50V, AM stop det. cplg.	3L0-0007-37
C416	C	.1 mfd/10V, Q402 base cplg.	3L0-0008-11
C417	C	.1 mfd/10V, Q403 base cplg.	3L0-0008-11
C418	C	2.2 mfd/20V, Q403 coll. filter	3L0-0011-28
C419	C	.01 mfd/16V, B+ bypass	3L0-0008-21
C420	C	.001 mfd/50V, AM stop det. cplg.	3L0-0007-37
C421	C	.05 mfd/16V, Q404 emit.	3L0-0008-24
C422	C	.33 mfd/10V, Q404 coll.	3L0-0011-6
C423	C	330 pf/500V, IC406 FM input	3L0-0007-1
C424	C	330 pf/500V, IC406 FM input	3L0-0007-1
C425	C	330 pf/500V, IC406 FM input	3L0-0007-1
C426	C	.33 mfd/10V, IC406 pin #9 & #10	3L0-0011-6
C427	C	.001 mfd/50V, IC406 pin #2	3L0-0007-37
C428	C	.01 mfd/16V, FM DC ref.	3L0-0008-21
C429	C	.1 mfd/12V, IC406 pin #7	3L0-0008-67
C430	C	.001 mfd/50V, Remote scan sw.	3L0-0007-37
C431	C	22 pf/500V, Xtal osc.	3L0-0007-13
C432	C	15 pf/500V, Xtal osc.	3L0-0006-76*
C433	C	150 mfd/16V, +8.2V filter	3L0-0009-45
C434	C	2.2 mfd/20V, Q418 base	3L0-0011-28
C435	C	.01 mfd/16V, Q418 base	3L0-0008-21
C436	C	.33 mfd/10V, Q418 base	3L0-0011-6
C437	C	10 mfd/20V, +8.2V filter	3L0-0011-10
C438	C	10 mfd/50V, -35V filter	3L0-0030-19
C439	C	150 mfd/16V, +5.6V filter	3L0-0009-45
C440	C	.1 mfd/16V, +5.6V filter	3L0-0008-38
C441	C	10 mfd/50V, Q421 coll.	3L0-0030-19
C442	C	1000 mfd/16V, A+ filter	3L0-0009-44
C443	C	150 mfd/16V, Q425 emit.	3L0-0009-45
C444	C	.02 mfd/16V, Q414 E to C	3L0-0008-56
C445	C	150 mfd/16V, +5.6V filter	3L0-0009-45
C446	C	.01 mfd/16V, AM B+ filter	3L0-0008-21
C447	C	.001 mfd/50V, FM B+	3L0-0007-37
C448	C	.068 mfd/12V, B+ filter	3L0-0008-68
C449	C	22 mfd/15V, Q420 emit.	3L0-0011-26
C450	C	220pf/500V, Q416 B to C	3L0-0007-15
C701	C	150 mfd/16V, Motor filter	3L0-0009-45
C702	C	10 mfd/20V, Motor filter	3L0-0011-4
C703	C	150 mfd/16V, Motor filter	3L0-0009-45
C801	C	1.0 mfd/10V, R. R. bass boost	3L0-0011-44
C802	C	.068 mfd/12V, R. R. Hi-cut	3L0-0008-68
C803	C	.15 mfd/3V, R. R. Vol. cplg.	3L0-0008-69
C805	C	1.0 mfd/10V, L. R. bass boost	3L0-0011-44
C806	C	.15 mfd/3V, L. R. Vol. cplg.	3L0-0008-69
C807	C	.068 mfd/12V, L. R. Hi-cut	3L0-0008-68
C809	C	1.0 mfd/10V, R. F. bass boost	3L0-0011-44
C810	C	.15 mfd/3V, R. F. Vol. cplg.	3L0-0008-69
C811	C	.068 mfd/12V, R. F. Hi-cut	3L0-0008-68
C813	C	1.0 mfd/10V, L. F. bass boost	3L0-0011-44
C814	C	.068 mfd/12V, L. F. Hi-cut	3L0-0008-68
C815	C	.15 mfd/3V, L. F. Vol. cplg.	3L0-0008-69
C901	C	.1 mfd/10V, L. F. tape input	3L0-0008-11
C902	C	.0068 mfd/100V, L. F. pre-amp	3L0-0007-55

*Warranty Component Category

ELECTRICAL PARTS LIST (Cont'd)
AM/FM STEREO RADIO/QUAD TAPE PLAYER MODEL D9LF

New parts not previously carried are indicated by the symbol "*" following the number.

SYM-BOL	*W A R R.	DESCRIPTION	SERVICE PART NO.	SYM-BOL	*W A R R.	DESCRIPTION	SERVICE PART NO.
C903	C	47 mfd/6V, L. F. gain	3L0-0011-41	D416	P	Rect., EAROM supply	3L4-3002-7
C904	C	.1 mfd/10V, R. F. tape input	3L0-0008-11	D417	P	Q422 base	3L4-3002-1
C905	C	.0068 mfd/100V, R. F. pre- amp	3L0-0007-55	D418	P	Q423 base	3L4-2003-4
C906	C	47 mfd/6V, R. F. gain	3L0-0011-41	D419	P	Q424 base	3L4-3002-1
C907	C	.1 mfd/10V, L.R. tape input	3L0-0008-11	D420	P	Q425 base	3L4-3002-1
C908	C	.0068 mfd/100V, L.R. pre- amp	3L0-0007-55	D421	P	AM INDICATOR B+	3L4-3002-1
C909	C	47 mfd/6V, L.R. gain	3L0-0011-41	D422	P	Q429 emit	3L4-2003-4
C910	C	.1 mfd/10V, R.R. tape input	3L0-0008-11	D423	P	Q429 base	3L4-3002-1
C911	C	.0068 mfd/100V, R.R. pre- amp	3L0-0007-55	D424	P	Q420 bias	3L4-2003-4
C912	C	47 mfd/6V, R.R. gain	3L0-0011-41	D901	P	Quad switch	3L4-2003-4
C913	C	.33 mfd/25V, L. F. pre- amp. out.	3L0-0011-45	DS601	P	LED 1st digit **	3L4-3005-3#
C914	C	.33 mfd/25V, R. F. pre- amp. out.	3L0-0011-45	DS602	P	LED 2nd digit **	3L4-3005-3#
C915	C	.33 mfd/25V, L. R. pre- amp. out.	3L0-0011-45	DS603	P	LED 3rd digit **	3L4-3005-3#
C916	C	.33 mfd/25V, R. R. pre- amp. out.	3L0-0011-45	DS604	P	LED 4th digit **	3L4-3005-3#
C917	C	10 mfd/20V, L. Audio in	3L0-0011-10	DS605	P	LED AM-FM-STEREO ** display	3L4-3005-2#
C918	C	10 mfd/20V, R. Audio in	3L0-0011-10	DZ201	P	Zener, 8.2V	3L4-3506-7
C919	C	.05 mfd/25V, B+ filter	3L0-0008-39	DZ202	P	Zener, 9.1V	3L4-3506-37
VC101		2-11 pf, FM ant.	3L1-0004-1	DZ301	P	Zener, 27V	3L4-3005-49
VC102		2-11 pf, FM RF	3L1-0004-1	DZ401	P	Zener, 5.6V	3L4-3506-21
VC103		2-11 pf, FM osc.	3L1-0004-1	DZ402	P	Zener, 8.2V	3L4-3506-7
VC201		2-11 pf, 1st AM RF	3L1-0004-1	DZ403	P	Zener, 8.2V	3L4-3506-7
VC202		2-11 pf, 2nd AM RF	3L1-0004-1	DZ901	P	Zener, 16V	3L4-3506-40
VC203		2-11 pf, AM osc.	3L1-0004-1				
		DIODES				VARACTORS	
D101	P	FM AGC	3L4-3002-31	VRAC101	P	FM ant. tun. (blue)	3L4-3508-2
D102	P	FM AGC	3L4-3002-31	VRAC102	P	FM RF tun. (blue)	3L4-3508-2
D103	P	FM AGC	3L4-3002-1	VRAC103	P	FM osc. tun. (white)	3L4-3508-1
D104	P	FM AGC	3L4-3002-1	VRAC201	P	AM tuning, 3 sect. (1st RF, osc. & 2nd RF)	3L4-3509-1#
D105	P	FM audio out	3L4-3002-1			PILOT LAMPS	
D106	P	FM audio gain	3L4-3002-1	DS1	K	#37 pilot lamp	3L4-0001-9
D202	P	AM AGC	3L4-2003-1	DS2	K	#37 pilot lamp	3L4-0001-9
D203	P	AM AGC	3L4-2003-1			INTEGRATED CIRCUITS	
D204	P	AM RF AGC	3L4-2003-1	IC101	S	FM IF amp & det.	3L4-9007-1
D205	P	Rect., -35V supply	3L4-3002-7	IC102	S	FM Audio gain latch	3L4-9027-1#
D206	P	Rect., -35V supply	3L4-3002-7	IC301	S	MPX decoder	3L4-9004-5
D207	P	AM B+	3L4-2003-4	IC302	S	R. F. Audio amp.	3L4-9020-2#
D208	P	AM det.	3L4-2003-1	IC303	S	L. R. Audio amp.	3L4-9020-2#
D209	P	AM osc. out.	3L4-3002-7	IC304	S	R. F. Audio amp.	3L4-9020-2#
D210	P	AM osc. out.	3L4-2003-1	IC305	S	L. F. Audio amp.	3L4-9020-2#
D301	P	Dual diode, audio L. chan	3L4-3006-1#	IC401	S	Controller	3L4-9026-1#
D302	P	Dual diode, audio R. chan	3L4-3006-1#	IC402	S	EAROM (Electrically Alterable Read Only Memory)	3L4-9028-1#
D303	P	Pre amp B+	3L4-2003-1	IC403	S	Quad switch	3L4-9027-3#
D304	P	L. chan. mute	3L4-3002-7	IC404	S	Prescaler (+ 100)	3L4-9029-1#
D305	P	R. chan. mute	3L4-3002-7	IC405	S	Segment driver	3L4-9025-1
D401	P	IC404 pin #6	3L4-3002-1	IC406	S	FM stop detector	3L4-9031-1#
D402	P	Q402 base input	3L4-2003-4	IC901	S	Tape pre-amp	3L4-9015-1
D403	P	Q402 base input	3L4-2003-4	IC902	S	Tape pre-amp	3L4-9015-1
D404	P	Q403 base	3L4-3002-1	IC903	S	Audio gate	3L4-9027-4#
D405	P	Q404 base	3L4-3002-1	IC904	S	Audio gate	3L4-9027-4#
D406	P	Q404 bias	3L4-2003-4	IC905	S	Radio Tape Function Gate	3L4-9027-2#
D407	P	FM stop det.	3L4-3002-1			COILS	
D408	P	FM stop det.	3L4-3002-1	L101	D	2.7 μh, AM ant.	3L2-0023-15
D409	P	FM tune voltage	3L4-3002-1	L102	D	1.0 μh, 10.7 MHz trap	3L2-0023-13
D410	P	FM tune voltage	3L4-3002-1	L103	D	.1 μh, Ant. input	3L2-0037-6
D413	P	AM tune voltage	3L4-2003-4	L201	D	1.0 μh, AM ant.	3L2-0023-13
D414	P	Q420 bias	3L4-3002-1	L202	D	130 μh, 455 KHz trap	3L2-0053-1#
D415	P	Q421 bias	3L4-3002-1				

*Warranty Component Category

** When ordering LED digits include MFR'S code "T"(TI) or "H"(HP) found on body of digit. Add code letter after part number.

ELECTRICAL PARTS LIST (Cont'd) AM/FM STEREO RADIO/QUAD TAPE PLAYER MODEL D9LF

New parts not previously carried are indicated by the symbol "*" following the number

SYM-BOL	*W A R R.	DESCRIPTION	SERVICE PART NO.	SYM-BOL	*W A R R.	DESCRIPTION	SERVICE PART NO.
L203	D	2.7 mh, RF choke	3L2-0023-14	R802	G	4.3K, R.R. audio	
L204	D	2.7 µh, RF choke	3L2-0023-15	R803	G	390, VR803C tap	
L205	D	2.7 mh, AM det. choke	3L2-0023-14	R804	G	4.3K, L.R. audio	
L206	D	2.7 mh, AM det. choke	3L2-0023-14	R805	G	390, VR803B tap	
L401	D	22 µh	3L2-0023-18	R806	G	4.3K, R.F. audio	
NETWORKS AND FILTERS				R807	G	390, VR803A tap	
F101	B	IF filter, 10.7 MHz	3L5-5004-2	R808	G	4.3K, L.F. audio	
F102	B	IF filter, 10.7 MHz	3L5-5004-2	R809	G	1.8K, L.F. base comp.	
F201	B	IF filter, 455 KHz	3L5-5012-1#	R810	G	1.8K, R.F. base comp.	
F401	B	IF filter, 455 KHz	3L5-5012-1#	R811	G	1.8K, L.R. base comp.	
N101	B	FM IF amp	3L5-0020-1	R812	G	1.8K, R.R. base comp.	
TRANSISTORS				R901	G	330K, L.F. pre-amp feedback	
Q101	A	AR224 FM RF	3L4-6007-35	R902	G	15K, L.F. pre-amp feedback	
Q102	A	AR220 FM mixer	3L4-6007-21	R903	G	150K, L.F. pre-amp gain	
Q103	A	AR222 FM osc.	3L4-6007-23	R904	G	330K, R.F. pre-amp feedback	
Q104	A	FM AGC	3L4-6007-42	R905	G	15K, R.F. pre-amp feedback	
Q201	A	AM RF amp.	3L4-6025-3#	R906	G	150K, R.F. pre-amp gain	
Q202	A	AM RF amp.	3L4-6025-3#	R907	G	330K, L.R. pre-amp feedback	
Q203	A	AR200 AM RF amp.	3L4-6007-1	R908	G	15K, L.R. pre-amp feedback	
Q204	A	AR202 High level AGC	3L4-6007-3	R909	G	150K, L.R. pre-amp gain	
Q205	A	AR202 Med. level AGC	3L4-6007-3	R910	G	330K, R.R. pre-amp feedback	
Q206	A	AR202 AM AGC	3L4-6007-3	R911	G	15K, R.R. pre-amp feedback	
Q207	A	AR201 AM osc.	3L4-6007-2	R912	G	150K, R.R. pre-amp gain	
Q208	A	AR201 AM osc. buffer	3L4-6007-2	R913	G	1.0M, Front audio gate	
Q209	A	AR213 AC/DC conv.	3L4-6007-14	R914	G	1.0M, Rear audio gate	
Q210	A	AR201 AM mixer	3L4-6007-2	R915	G	1.0K, Pre-amp B+	
Q211	A	AR202 AM IF amp.	3L4-6007-3	R916	G	120K, L. audio input	
Q212	A	AR202 AM IF amp.	3L4-6007-3	R917	G	120K, R. audio input	
Q213	A	AR215 AM audio out	3L4-6007-16	R918	G	2.2M, L.F. audio out.	
Q301	A	AR203 AM mute	3L4-6007-4	R919	G	2.2M, R.F. audio out.	
Q302	A	AR203 AM mute	3L4-6007-4	R920	G	2.2M, L.R. audio out.	
Q303	A	AR203 AM mute	3L4-6007-4	R921	G	2.2M, R.R. audio out.	
Q401	A	AR203 FM gain red.	3L4-6007-4	R922	G	100K, Rear inverter input	
Q402	A	AR202 455 KHz amp.	3L4-6007-3	R923	G	100K, Front inverter input	
Q403	A	AR202 AM stop det.	3L4-6007-3	R924	G	220K, IC904 L. input	
Q404	A	AR202 AM stop det.	3L4-6007-3	R925	G	220K, IC904 R. input	
Q405	A	AR202 Stop amp.	3L4-6007-3	CONTROLS			
Q413	A	AR303 Decimal driver	3L4-6010-3	VR101	H	5K, FM DC ref. adj.	3L3-0050-1
Q414	A	AR303 Stereo ind. driver	3L4-6010-3	VR101	H	5K, FM DC ref. adj. (opt.)	3L3-0050-11#
Q415	A	AR203 AM-FM ind. driver	3L4-6007-4	VR301	H	5K, 76 KHz osc. adj.	3L3-0027-5
Q416	A	AR303 AM-FM ind. driver	3L4-6010-3	VR801A, B	H	2 Sect. 50K, Balance left & right	3L3-0051-3#
Q418	A	AR223 DC converter	3L4-6007-34	VR802A, B, C & D	H	4 Sect. 150K, Tone	3L3-0051-1#
Q419	A	AR223 DC converter	3L4-6007-34	VR803A, B, C & D	H	4 Sect. 15K, Volume	3L3-0051-2#
Q420	A	AR223 Switch EAROM power supply	3L4-6007-34	VR804A & B	H	2 Sect. 50K, Balance (front & rear)	3L3-0051-3#
Q421	A	AR304 Osc. EAROM power supply	3L4-6010-4	VR901	H	1.0K, L.F. pre-amp gain	3L3-0050-2
Q422	A	4th digit driver	3L4-6024-1	VR901	H	1.0K, L.F. pre-amp gain (opt.)	3L3-0050-12#
Q423	A	3rd digit driver	3L4-6024-1	VR902	H	1.0K, R.F. pre-amp gain	3L3-0050-2
Q424	A	2nd digit driver	3L4-6024-1	VR902	H	1.0K, R.F. pre-amp gain (opt.)	3L3-0050-12#
Q425	A	1st digit driver	3L4-6024-1	VR903	H	1.0K, L.R. pre-amp gain	3L3-0050-2
Q426	A	AR27 DC regulator (11 volts)	3L4-6013-6	VR903	H	1.0K, L.R. pre-amp gain (opt.)	3L3-0050-12#
Q427	A	AR203 DC regulator (11 volts)	3L4-6007-4				
Q428	A	33, DC regulator (5 volts)	3L4-6024-2#				
Q429	A	AR223 Remote scan switch	3L4-6007-34				
Q430	A	AR223 Intensity control	3L4-6007-34				
Q431	A	AR303 FM B+ buffer	3L4-6010-3				

*Warranty Component Category

ELECTRICAL PARTS LIST (Cont'd)
AM/FM STEREO RADIO/QUAD TAPE PLAYER MODEL D9LF

New parts not previously carried are indicated by the symbol "#" following the number.

SYM-BOL	*W A R R.	DESCRIPTION	SERVICE PART NO.
VR904	H	1.0K, R.R. pre-amp gain	3L3-0050-2
VR904	H	1.0K, R.R. pre-amp gain (opt.)	3L3-0050-12#
SWITCHES			
S1	R	Program Select	
S2	R	Quad-Stereo	
S3	R	Radio-Tape	
S4	R	Auto. tape adv.	
S601	I	Recall, Bridge contact	2L8-0777-1
S602	I	Recall, Bridge contact	2L8-0777-1
S603	I	Recall, Bridge contact	2L8-0777-1
S604	I	Recall, Bridge contact	2L8-0777-1
S605	I	Recall, Bridge contact	2L8-0777-1
S606	I	Seek, Bridge contact	2L8-0777-1
S607	I	Scan, Bridge contact	2L8-0777-1
S601-7	I	Button contact (part of S601, 2, 3, 4, 5, 6 & 7)	2L8-0778-1
S801	I	TUNE	4L2-0027-3#
S802	I	SET-TA	4L2-0027-4#
S803	I	AM-FM	4L2-0027-2#
S804	I	ON-OFF	4L2-0027-1#

SYM-BOL	*W A R R.	DESCRIPTION	SERVICE PART NO.
TRANSFORMERS			
T101	D	AM ant.	3L2-0043-1
T102	D	FM RF	3L2-0054-1#
T103	D	FM osc.	3L2-0028-2
T104	D	FM IF	3L2-0022-1
T105	D	FM det.	3L2-0030-2
T201	D	AM ant.	3L2-0049-2#
T202	D	AM RF	3L2-0050-1#
T203	D	AM RF "Z" match.	3L2-0051-1#
T204	D	AM 2nd RF	3L2-0050-2#
T205	D	AM osc.	3L2-0052-1#
T206	D	AM osc. AC-DC conv.	3L2-0051-2#
T207	D	AM 1st IF	3L2-0036-3#
T208	D	AM 2nd IF	3L2-0053-2#
T401	D	Osc., Minus DC supply	3L2-0051-3
CRYSTALS			
X401		2.6 MHz xtal	3L5-5011-2#

*Warranty Component Category

MECHANICAL AND ELECTRICAL MISCELLANEOUS PARTS LIST

AM/FM STEREO RADIO/QUAD TAPE PLAYER MODEL D9LF

New parts not previously carried are indicated by the symbol "#" following the number.

*W A R R.	DESCRIPTION	SERVICE PART NO.
L	Bezel assy. (bezel, tape door, pin, springs & light seal),	3L8-0998#
N	Cable assy., A+ and P.L	7L6-0479-13#
N	Cable assy., Audio to FM	4L1-0166-6#
N	Cable assy., Ant. to AM	4L1-0166-1#
N	Cable assy., MC to Logic	4L1-0166-3#
N	Cable assy., MC to Pre-amp	4L1-0166-4#
N	Cable assy., Pre-amp	4L1-0166-2#
N	Cable assy., Speaker	7L6-0392-8#
N	Cable assy., Track select	4L1-0166-5#
N	Clamp, Strain relief (A+ & spkr. cables)	2L8-0226-2
Z	Connector, "F" post, PW panel	2L8-0489-1
Z	Connector, Straight post, PW panel	2L8-0516-1
Z	Cover, Housing (Top)	2L8-0792-1#
Z	Door, Tape,	2L8-0797-1#
N	Flexcable (9 wires)	4L1-0425-1#
N	Flexcable (11 wires)	4L1-0425-2#
A	Heat sink assy. Audio IC (less transistors)	3L8-1015#
Z	Housing assy.	7L6-0764-1#
Z	Housing assy., Side (FM)	7L6-0765-1#
Z	Insulator, AGC	5L4-0124-1#
Z	Insulator, Display P.W.	5L4-0127-1#
Z	Insulator, FM P.W.	5L4-0124-1#
Z	Insulator. Pre-amp	5L4-0128-1#

*W A R R.	DESCRIPTION	SERVICE PART NO.
Z	Insulator, Shield Logic P.W.	5L4-0126-1#
Z	Insulator, Top cover	5L4-0125-1#
Z	Insulator, Wire dress	5L4-0139-1#
O	Knob, Balance (2 used)	2L7-0552-1
O	Knob, Vol., Tone	2L7-0551-1
Z	Light Seal, Display	5L4-0138-1#
Z	Pin, Rocker Knob	2L8-0798-1#
Z	Pin, Tape door	2L8-0415-1#
M	P.W. assy., AGC panel	3L8-1016#
M	P.W. assy., AM/MPX/AUDIO	3L8-1014#
M	P.W. assy., Control panel	3L8-1004#
M	P.W. assy., Display	3L8-1010#
M	P.W. assy., FM	3L8-1000#
M	P.W. assy., Logic and display	3L8-1009#
M	P.W. assy., Motor filter	3L8-1007#
M	P.W. assy., Pre-amp	3L8-1006#
	Rocker Knob, S801, 2, 3 & 4	2L7-0553-1#
	Screw, 6-32 TT, Front brkt. to tape deck	LW-0026-1#
	Screw, #4 TT pan hd., bezel mtg.	LW-0026-3#
	Screw, #4B x 1/4"	1W19872FA3
	Screw, #6B x 1/4"	1W19881FA3
	Screw, #4B x 3/8"	1W19874FA3
	Shield assy., Logic P.W.	7L6-0766-1
	Socket, Ant. (J101)	2L7-0139-1
	Socket assy., Pilot light	4L1-0095-3

*Warranty Component Category

ALIGNMENT PROCEDURE OF AM-FM RADIO

Alignment was performed at factory with laboratory test equipments. Therefore, before alignment the set should be thoroughly checked up on the circuit in free from troubles at first, and note following matter prior to proceed on alignment.

- * Check up the specified Voltages and source polarity.
- * Use fresh batteries or well regulated DC power supply.
- * Connect speaker or dummy load resistor 4 to 8 ohms to output cables.
- * Non-metallic tools must be used for especially IF and RF Sect. alignments.
- * Signal input must be kept as low as possible to avoid over load and clipping using highest possible sensitivity output indicator.
- * In connection of signal source and indicator to the test point the lower side should be connected to the ground closed to the test point high side connected.
- * Be sure no static coupling between input and output signal.

i) FM RADIO SECTION ALIGNMENT using sweep signal generator.

- Notes: 1. When sweep signal generator is used for alignment of FM IF stage, the marker color is set at center part of "S" curve trace. Because of fixed ceramic filters, five kinds of center frequency, are used in, which is identified as follows; Yellow-10.78, Red-10.70, White-10.74, Black-10.66 and Green-10.62 MHz.
2. In order to make correct alignment of front end and IF-stage, input signal must be kept lower than 10 uV at antenna input.

STEP	CONNECT SIGNAL SOURCE TO	CONNECT OUTPUT INDICATOR TO	SET SIGNAL SOURCE	SET RADIO DIAL	ADJUST ON	ADJUST FOR
1	Lock FM/AM switch for FM position.					
2	Sweep signal generator to test point located in front end unit through 1K ohm resistor	Oscilloscope to the test point through 0.01µF capacitor	10.7MHz (unmodulated)	Quiet point on band	IFT-101	Maximum amplitude ("S" curve trace)
3					IFT*	Maximum amplitude * Located in front end unit
4	Repeat above steps to make sure the alignment has been made correctly.					
5	Signal generator to antenna input terminal through matching net work (no sweep)	VTVM to the speaker cable terminated with 4 to 8 ohms dummy load	108MHz	108MHz	OT*	Maximum amplitude
6			88MHz	88MHz	OSC	Maximum amplitude
7			106MHz	106MHz	AT* & RT*	Maximum amplitude
8	Repeat above three steps to make sure the alignment has been made correctly.					* Located in front end unit.

ii) AM RADIO SECTION ALIGNMENT

- Notes: 1. RF signal generator is connected to the antenna input terminal through matching net-work.
2. Modulation level is 40% maximum.
3. RF signal level is kept as lower as possible.
4. Output indicator is connected to the Left or Right speaker cable terminated with 4 to 8 ohms resistor.

STEP	SOURCE SIGNAL	SET RADIO DIAL TO	ADJUST ON	ADJUST FOR
1	Unlock FM-AM switch for AM position.			
2	262.5 KHz	Quiet point on band	IFT-201, 202, 203, 204	Maximum amplitude.
3	1,610 KHz	1,610. KHz	CT-202	Maximum amplitude.
4	530 KHz	530 KHz	OSC	Maximum amplitude.
5	1,400 KHz	1,400 KHz	CT-101, 201	Maximum amplitude.
6	Repeat above steps to make sure the correct alignment has been made.			

iii) FM MULTIPLEX DEMODULATOR ALIGNMENT using FM signal generator and MULTIPLEX STEREO signal generator.

1. Connect the signal generator with antenna input terminal and adjust VR101 to obtain the stereo when the input level is approximately 20 db.
2. Connect the frequency counter to the test point (TP) of IC102 (Pin No. 10) and then adjust VR102 within the limits of 19 kHz ±100 Hz.
3. Adjust VR103 to obtain the maximum separation.

PART LOCATION

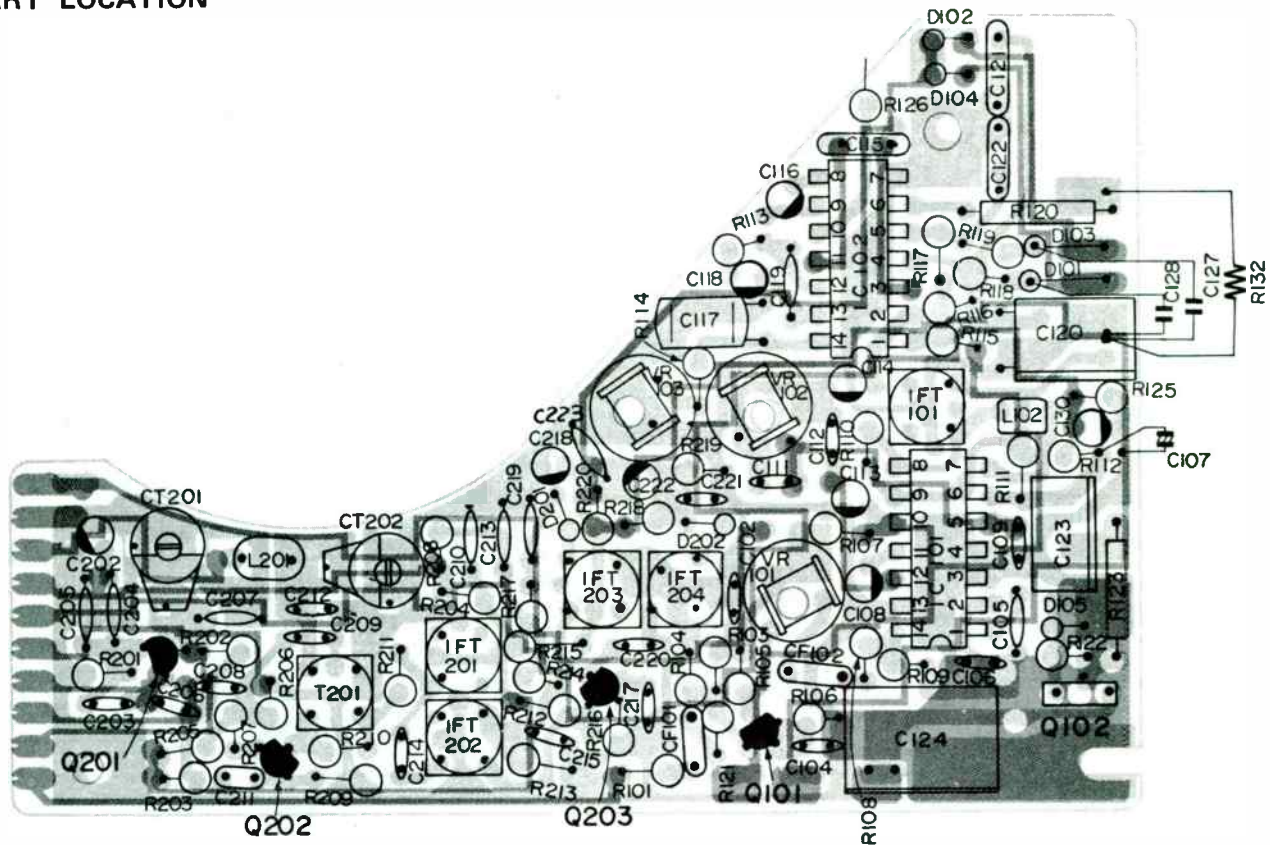
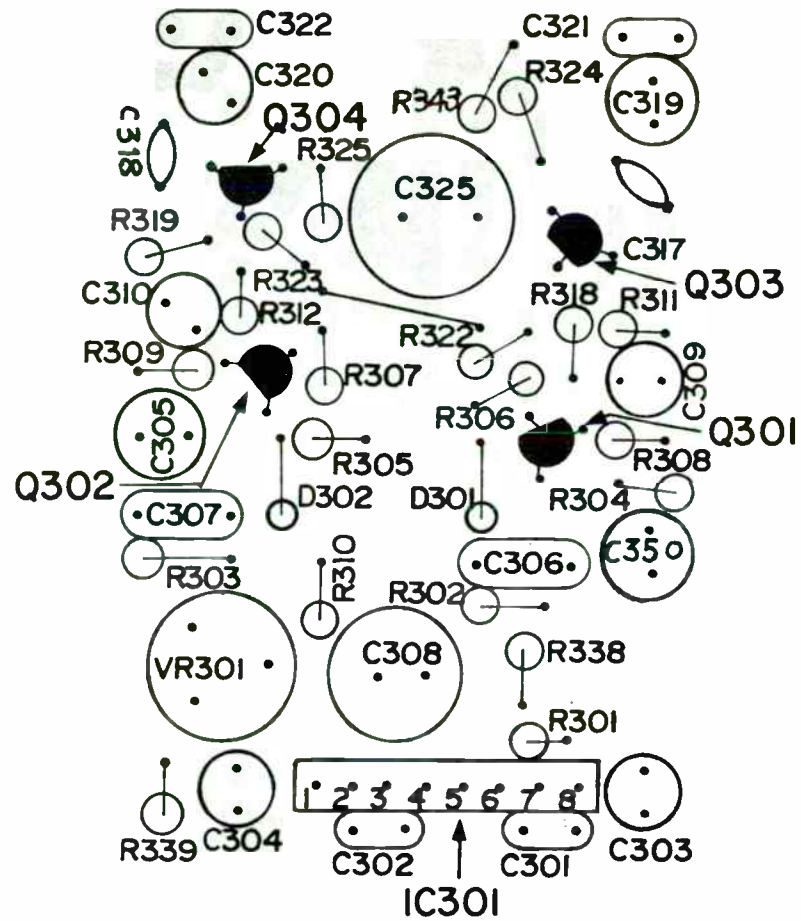
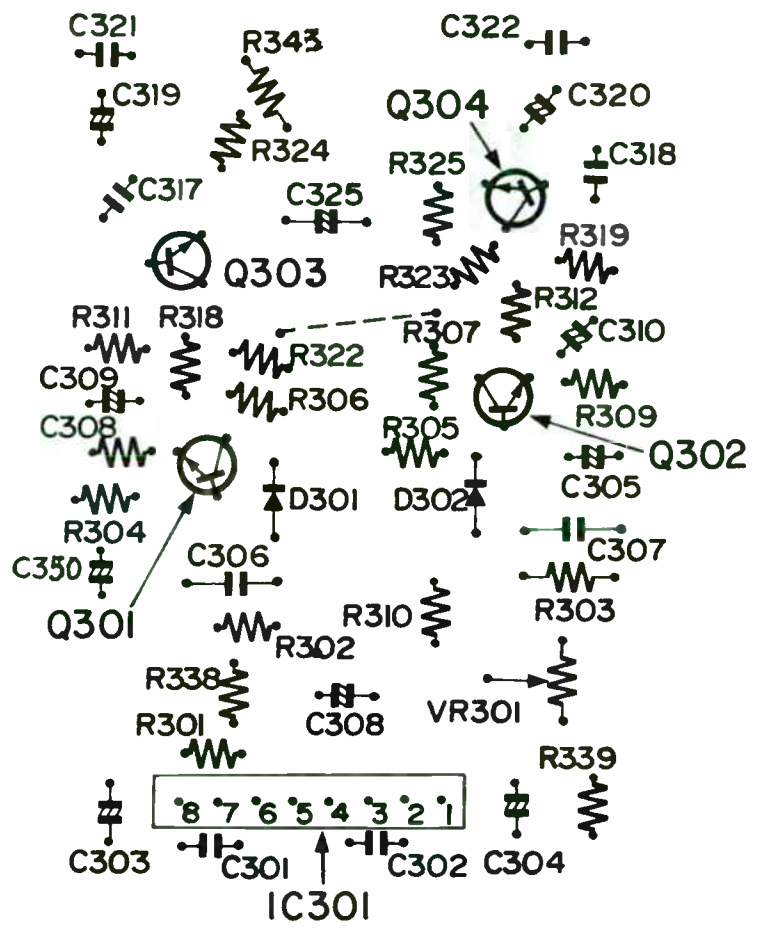


Fig. 7
IF AMP. P.C. BOARD
COMPONENT/WIRING SIDES

Fig. 8
PRE-AMP. P.C. BOARD
COMPONENT/WIRING SIDES



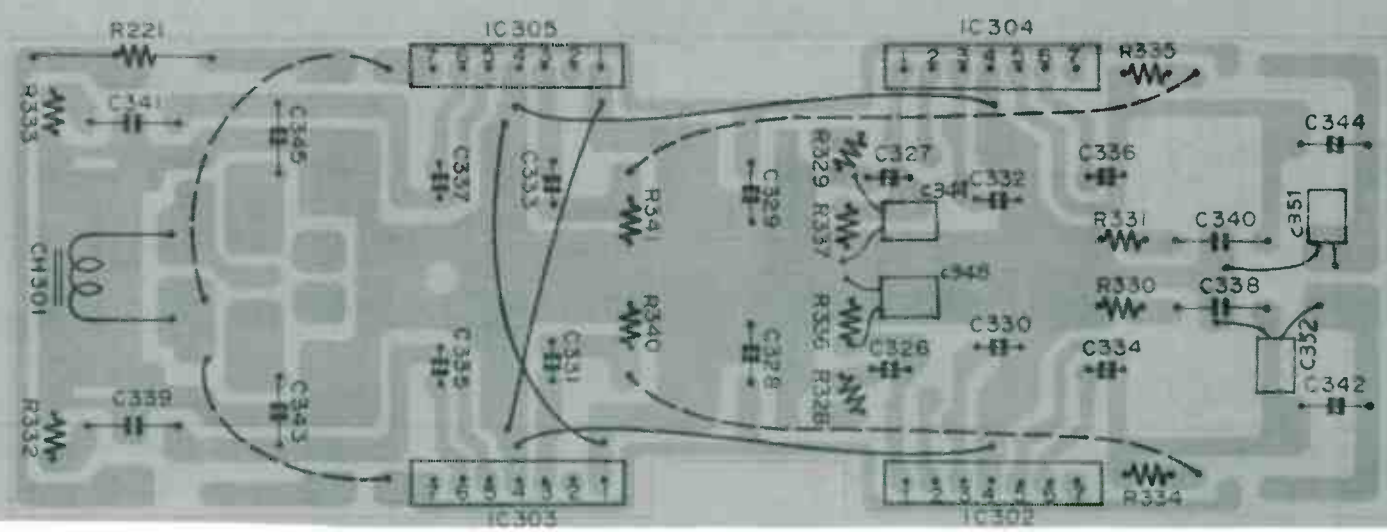
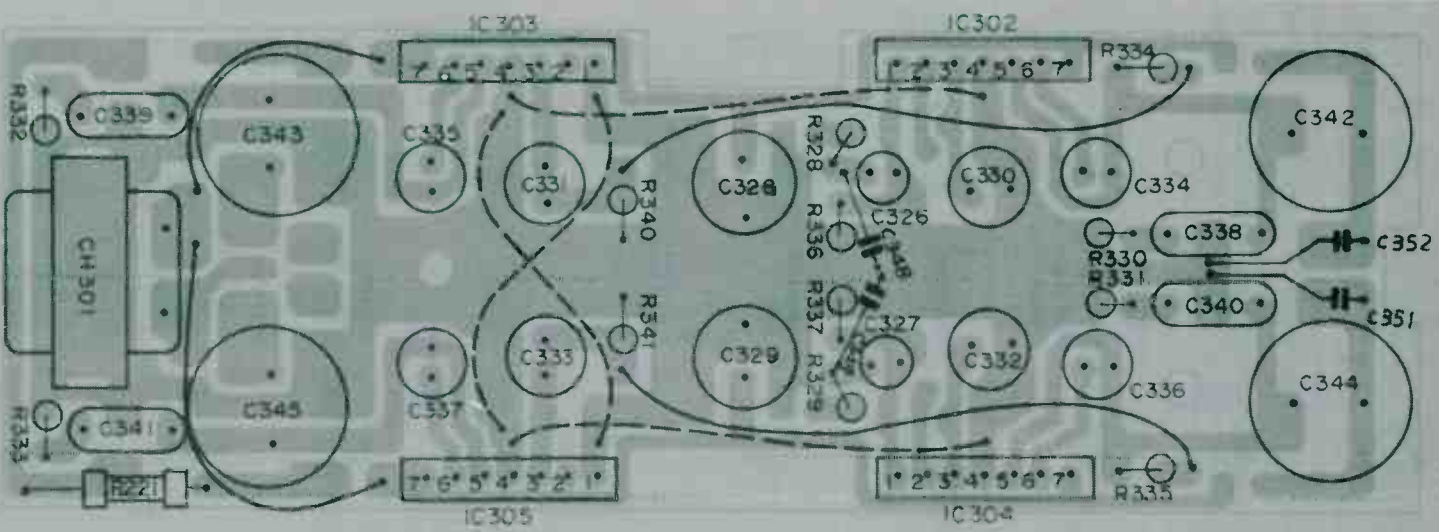


Fig. 9
POWER AMP. P.C. BOARD
COMPONENT/WIRING SIDES

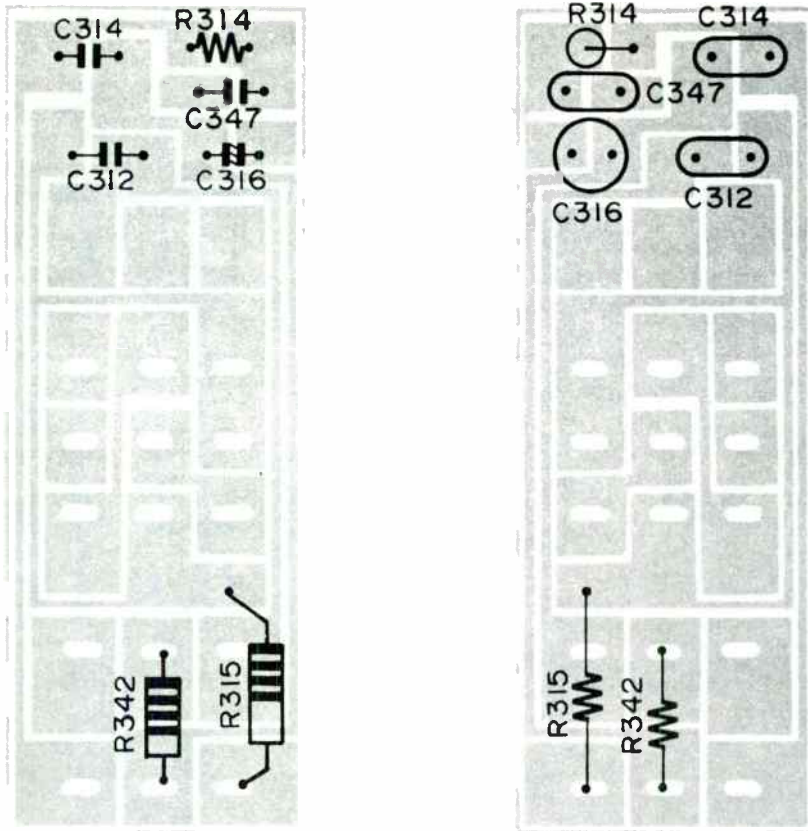


Fig. 10
VR P.C. BOARD (A)
COMPONENT/WIRING SIDES

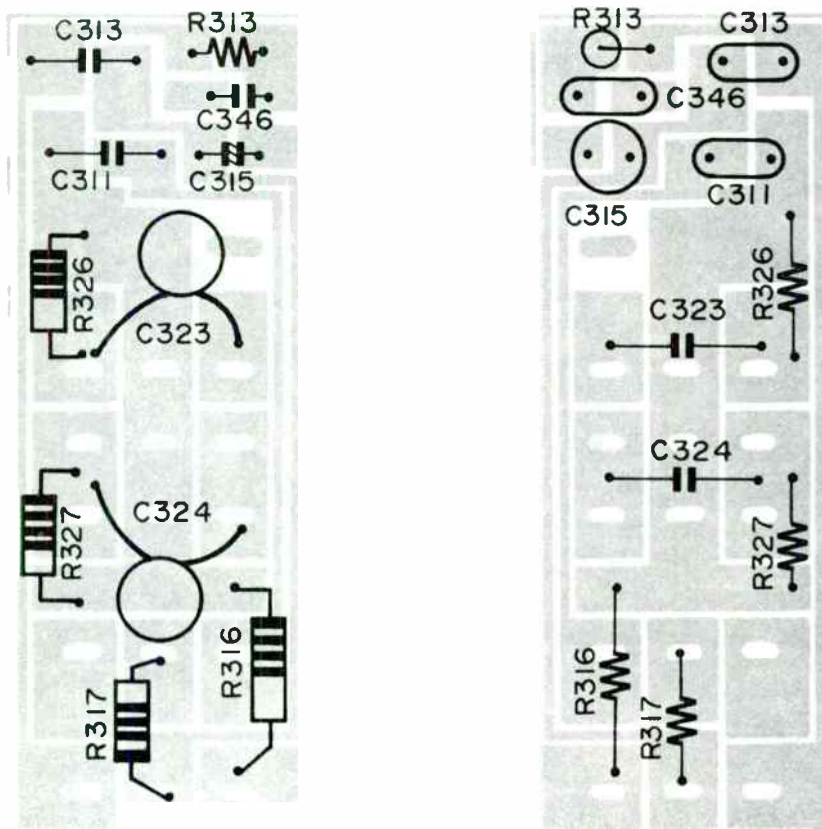


Fig. 11
VR P.C. BOARD (B)
COMPONENT/WIRING SIDES

PART LOCATION

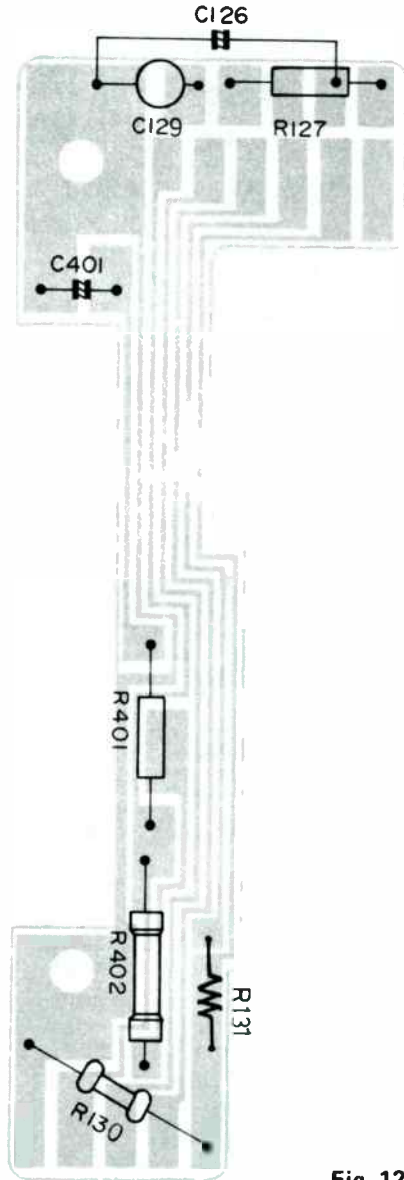
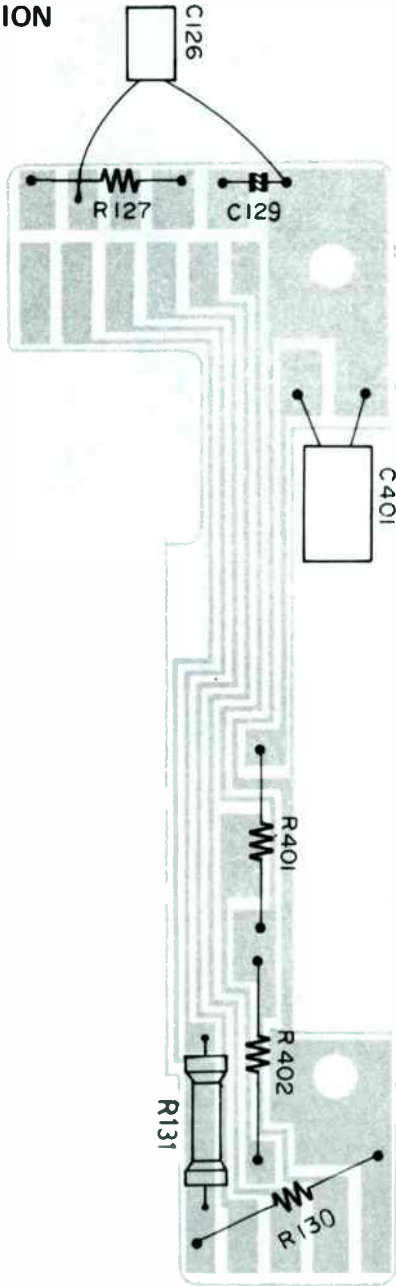


Fig. 12
RELAY P.C. BOARD
COMPONENT/WIRING SIDES

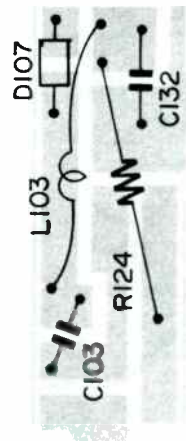
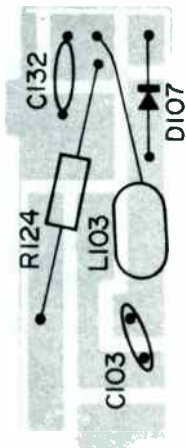
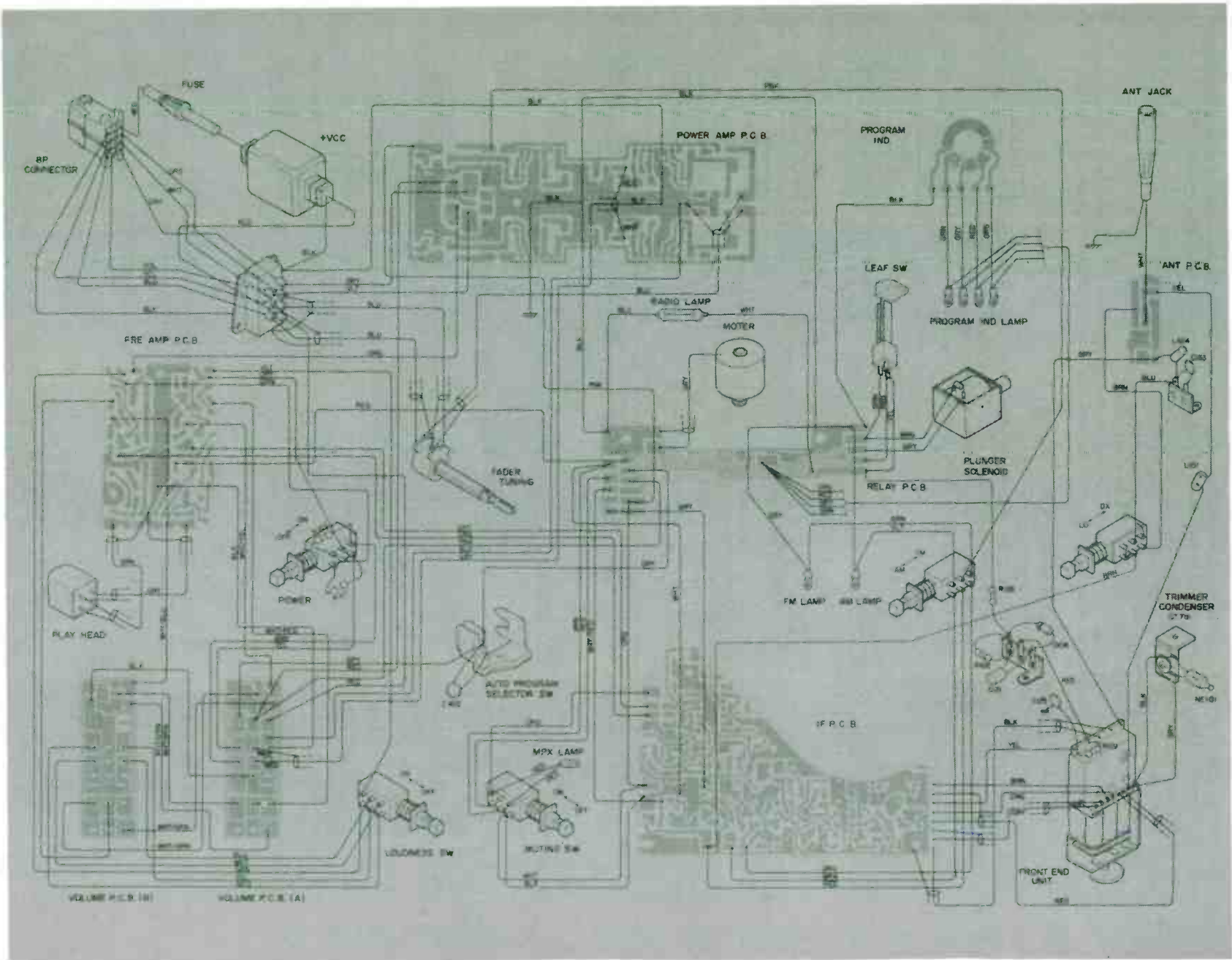
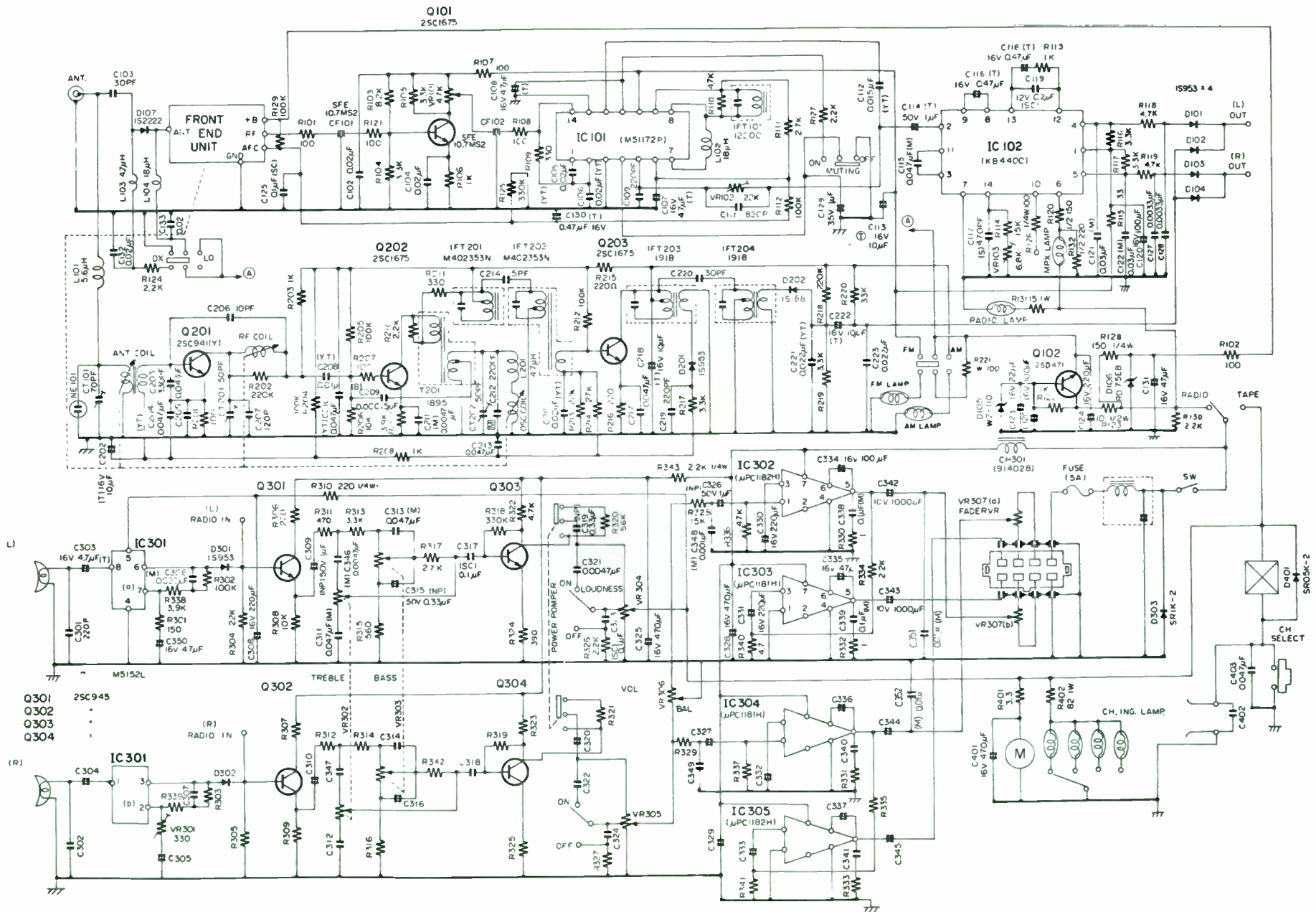
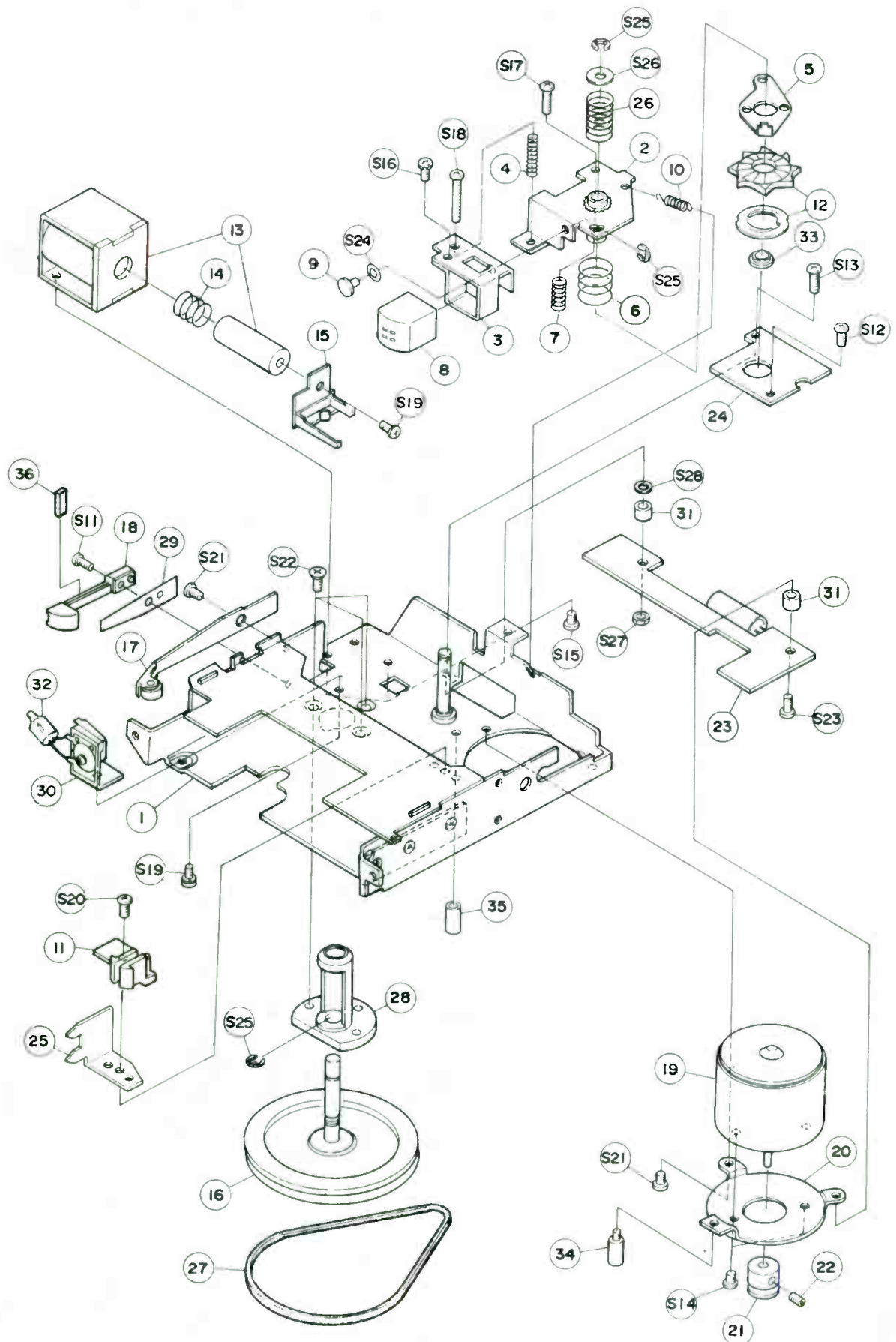


Fig. 13
ANT P.C. BOARD
COMPONENT/WIRING SIDES



SCHEMATIC DIAGRAM Fig. 14





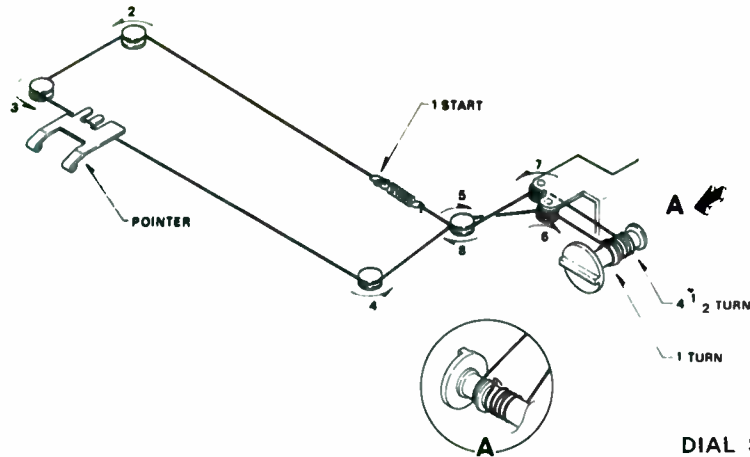


Fig. 16
DIAL STRING ARRANGEMENT

VOLTAGE READINGS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
IC101	2.0	2.0	0	0 (1.92)	7.1	6.0	5.4	5.4	5.4	10.1	1.96 (0.1)	0	0	2.1
IC102	9.6	2.8	5.0	6.8	6.8	13.5 (1.9)	0	2.1	2.1	1.6	2.1	2.1	2.1	2.8
IC301	1.4	0.8	3.1	12.7	0	3.1	0.8	1.4	-	-	-	-	-	-
IC302, 303 304, 305	0	2.0	1.4	0	6.7	12.5	13.6	-	-	-	-	-	-	-

	Q101	Q102	Q201	Q202	Q203	Q301, 302	Q303, 304
Enitter	2.0	10.7	0.2	1.5	1.4	2.0	0.4
Base	2.7	10.1	0.8	7.1	1.1	2.6	1.0
Collector	6.2	13.4	9.8	9.3	10.0	8.2	3.3

(): FM MUTING ON

THESE VOLTAGES MEASURED WITH VTVM AT NO SIGNAL INPUT.

COMPONENTS LIST (Re. Fig-18 Tape Transport Mechanism)

Drawing Ref. No.	Part No.	Description	Q'ty	Drawing Ref. No.	Part No.	Description	Q'ty
1	21626	Main Chassis	1	7	23600	Spring, Area Biss	1
2	21380	Head Bracket Ass'y	1	8	917005	Head	1
3	23575	Head Clamper	1	9	23606	Pin, Head Clamper	1
4	23588	Spring, Azimuth	1	10	23605	Tension Spring, Head Bracket	1
5	23576	Bracket, Cam	1	11	21367	Automatic Track Selector Switch	1
6	23589	Spring, Head Area Adjustment	1	12	21372	Cam Ass'y	1

COMPONENTS LIST (Re. Fig-18 Tape Transport Mechanism) (Cont'd)

Drawing Ref. No.	Part No.	Description	Q'ty
13	920013	Plunger	1
14	23748	Spring, Plunger	1
15	21381	Cam Pushing Base Ass'y	1
16	21375	Flywheel Ass'y	1
17	21390	Side Pressure Lever Ass'y	1
18	912043	Leaf Switch	1
19	911019	Motor	1
20	24078	Bracket, Motor	1
21/22	23580/022618	Motor Pulley w/Lock Screw	1
23	30935	Relay P.C. Board	1
24	32203	Print Board, Indicator	1
25	23595	Tape Guide	1
26	23586	Spring, Head Bracket	1
27	23590	Drive Belt	1
28	23592	Bracket, Capstan	1
29	23352	Insulator, Switch	1
30	913271	Antenna, Trimmer 70pF	1
31	24063	Collar, Relay P.C.B.	2
32	923107	Neon Tube	1
33	23607	Cam Washer	1
34	44343	Collar, IF P.C.B.	1
35	44658	Spacer	1

Drawing Ref. No.	Part No.	Description	Q'ty
36		Cushion Foam	1
S11	022008	Screw M2 x 8, RH	1
S12	022607	Screw M2.6 x 4, RH	1
S13	022653	Screw M2.6 x 12, RH	1
S14	022678	Screw M2.6 x 3, Truss	2
S15	023088	Screw M3 x 4, BH	2
S16	023142	Screw M3 x 4 w/Spring Washer	1
S17	023042	Screw M3 x 10, RH (Area Adj)	1
S18	023052	Screw M3 x 18, RH (Head Height Adj)	1
S19	023048	Screw M3 x 6 w/Spring Washer	2
S20	023131	Screw M3 x 10, RH	1
S21	023123	Screw M3 x 6, RH	2
S22	023097	Screw M3 x 6, PH	3
S23	023067	Screw M3 x 8, BH	1
S24	034014	Washer M4, Wave	1
S25	031016	E Ring M3	2
S26	034111	Washer M4, Plain	1
S27	012601	Nut M2.6, Hex.	1
S28	033025	Washer M3, Plain	1

ELECTRICAL COMPONENTS LIST

Ref. No.	Part No.	Description	Q'ty
Q101	916144	Silicon Transistor 2SC1675	1
Q102	916126	Silicon Transistor 2SD471	1
Q201	916127	Silicon Transistor 2SC941	1
Q202, 203	916144	Silicon Transistor 2SC1675	2
Q301 thru. 304	916033	Silicon Transistor 2SC945	4
IC101	915157	IC M51172P	1
IC102	916108	IC KB4400	1
IC301	916106	IC M5152L	1
IC302	916172	IC uPC1182H	1
IC303, 304	916171	IC uPC1181H	2
IC305	916172	IC uPC1182H	1
D101 thru 104	923147	Diode IS953, Switching	4
D105	923233	Diode WZ-110, Zenor	1
D106	923495	Diode RD7.5EB	1
D107	923395	Diode IS2222	1
D201	923147	Diode IS953	1
D202	922604	Diode IS188	1
D301, 302	923147	Diode IS953	2
D303	922969	Diode SR-1K-2	1
D401	922799	Diode SR-05K-2	1
L101	913491	Micro Inductor 5.6uH	1
L102	913563	Micro Inductor 18uH	1
L103	913239	Micro Inductor 4.7uH	1
L104	913557	Micro Inductor 18uH	1
T201	922592	OSC Coil 1895N	1
L201	913239	Micro Inductor 4.7uH	1
IFT101	923133	IFT, FM 12200	1
IFT201, 202	922838	IFT, AM 402353N	2
IFT203, 204	922593	IFT, AM 1918	2
CH301	914028	Choke Coil	1
CF101, 102	922974	Ceramic Filter SFE10.7MSZ	2
NE101	923107	Neon Tube	1

Ref. No.	Part No.	Description	Q'ty
CAPACITORS, all are in 50 working voltage unless otherwise specified.			
C102	913125	Ceramic 0.02uF 50V	1
C103	913171	Ceramic 30pF	1
C104	913125	Ceramic 0.02uF	1
C105, 106	913539	Ceramic 0.02uF (YT)	2
C107, 108	913471	Tantalum 4.7uF 16V	2
C109	913077	Ceramic 220pF 50V	1
C110		No component	
C111	913393	Ceramic 820pF 50V	1
C112	913541	Ceramic 0.015uF (YT)	1
C113	913381	Tantalum 10uF 16V	1
C114	913462	Tantalum 1uF 50V	1
C115	913044	Mylar 0.047uF	1
C116	913401	Tantalum 0.47uF 16V	1
C117	913096	Polystyren 470pF	1
C118	913401	Tantalum 0.47uF 16V	1
C119	913284	Semi-Con 0.2uF 12V (SC)	1
C120	913097	Electrolytic 100uF 16V	1
C121, 122	913120	Mylar 0.03uF	2
C123	913217	Electrolytic 22uF 16V	1
C124	913069	Electrolytic 220uF 16V	1
C125	913331	Semi-Con 0.1uF 12V (SC)	1
C126	913097	Electrolytic 100uF 16V	1
C127, 128	913102	Mylar 0.0033uF	2
C129	913445	Tantalum 1uF 35V	1
C130	913401	Tantalum 0.47uF 16V	1
C131	913180	Electrolytic 47uF 16V	1
C132, 133	913125	Ceramic 0.02uF	2
C202	913381	Tantalum 10uF 16V	1
C203	913073	Ceramic 330pF	1
C204	913538	Ceramic 0.047uF (YT)	1
C205	913063	Ceramic 0.047uF	1
C206	913052	Ceramic 10pF	1

ELECTRICAL COMPONENTS LIST (Cont'd)

Ref. No.	Part No.	Description	Q'ty	Ref. No.	Part No.	Description	Q'ty
C207	913249	Ceramic 120pF	1	R123	915091	10 ohm 1/2W	1
C208	913540	Ceramic 0.01uF (YT)	1	R124	915007	2.2K " 1/8W	1
C209	913210	Ceramic 0.0015uF (B)	1	R125	915443	330K " "	1
C210	913538	Ceramic 0.047uF (YT)	1	R126	915077	100 " 1/4W	1
C211	913040	Mylar 0.0047uF	1	R127	915007	2.2K " 1/8W	1
C212	913361	Mica 220pF	1	R128	915181	150 " 1/4W	1
C213	913063	Ceramic 0.047uF	1	R129	915039	100K " 1/8W	1
C214	913053	Ceramic 5pF	1	R130	915007	2.2K " "	1
C215	913539	Ceramic 0.02uF (YT)	1	R131	915302	15 " 1W	1
C216		No component		R132	915098	220 " 1/2W	1
C217	913063	Ceramic 0.047uF	1	R201	915009	100 " 1/8W	1
C218	913391	Tantalum 10uF 16V	1	R202	915344	220K " "	1
C219	913077	Ceramic 220pF	1	R203	915003	1K " "	1
C220	913171	Ceramic 30pF	1	R204, 205	915039	100K " "	2
C221	913539	Ceramic 0.022uF (YT)	1	R206	915015	10K " "	1
C222	913381	Tantalum 10uF 16V	1	R207	915009	100 " "	1
C223	913539	Ceramic 0.022uF (YT)	1	R208	915003	1K " "	1
C301, 302	913077	Ceramic 220pF	2	R209	915325	3.9K " "	1
C303, 304	913471	Tantalum 4.7uF 16V	2	R210	915007	2.2K " "	1
C305	913180	Electrolytic 47uF 16V	1	R211	915351	330 " "	1
C306, 307	913010	Mylar 0.022uF	2	R212	915039	100K " "	1
C308	913069	Electrolytic 220uF 16V	1	R213	915342	22K " "	1
C309, 310	913349	Electrolytic 1uF 50V (NP)	2	R214	915395	27K " "	1
C311 thru 314	913044	Mylar 0.047uF	4	R215, 216	915336	220 " "	2
C315, 316	913141	Electrolytic 0.33uF (NP)	2	R217	915004	3.3K " "	1
C317, 318	913331	Semi-Con 0.1uF 12V (SC)	2	R218	915344	220K " "	1
C319, 320	913141	Electrolytic 0.33uF 50V (NP)	2	R219	915004	3.3K " "	1
C321, 322	913040	Mylar 0.0047uF	2	R220	915052	33K " "	1
C323, 324	913331	Semi-Con 0.1uF 12V (SC)	2	R221	915352	100 " 1W	1
C325	913030	Electrolytic 470uF 16V	1	R301	915354	150 " 1/8W	1
C326, 327	913349	Electrolytic 1uF 50V (NP)	2	R302, 303	915039	100K " "	2
C328, 329	913030	Electrolytic 470uF 16V	2	R304, 305	915342	22K " "	2
C330 thru 333	913069	Electrolytic 220uF 16V	4	R306, 307	915336	220 " "	2
C334	913097	Electrolytic 100uF 16V	1	R308, 309	915015	10K " "	2
C335	913180	Electrolytic 47uF 16V	1	R310	915043	220 " 1/4W	1
C336	913097	Electrolytic 100uF 16V	1	R311, 312	915057	470 " 1/8W	2
C337	913180	Electrolytic 47uF 16V	1	R313, 314	915004	3.3K " "	2
C338 thru 341	913021	Mylar 0.1uF 50V	4	R315, 316	915410	560 " "	2
C342 thru 345	913013	Electrolytic 1000uF 10V	4	R317	915053	2.7K " "	1
C346, 347	913040	Mylar 0.0047uF 50V	2	R318, 319	915443	330K " "	2
C348, 349	913071	Mylar 0.001uF	2	R320, 321	915167	56K " "	2
C350	913180	Electrolytic 47uF 16V	1	R322, 323	915327	4.7K " "	2
C351, 352	913020	Mylar 0.01uF 50V	2	R324, 325	915335	390 " "	2
C401	913030	Electrolytic 470uF 16V	1	R326, 327	915007	2.2K " "	2
C402, 403	913063	Ceramic 0.047uF 50V	2	R328, 329	915341	15K " "	2
CT101	913271	Trimmer, Antenna 70pF	1	R330 thru 333	915523	1 " "	4
CT201, 202	913533	Trimmer, Antenna 50pF	2	R334, 335	915097	2.2K " 1/4W	2
RESISTORS				R336, 337	915343	47K " 1/8W	2
R101, 102	915009	100 ohm 1/8W	2	R338, 339	915325	3.9K " "	2
R103	915055	8.2K " "	1	R340, 341	915324	4.7 " "	2
R104, 105	915044	3.3K " "	2	R342	915053	2.7K " "	1
R106	915003	1K " "	1	R343	915097	2.2K " 1/4W	1
R107, 108	915009	100 " "	2	R401	915065	3.3 " 1/2W	1
R109	915351	330 " "	1	R402	915216	82 " 1W	1
R110	915327	4.7K " "	1	VR101	915370	Solid Volume 4.7K ohm	1
R111	915053	2.7K " "	1	VR102	915262	Solid Volume 22K	1
R112	915039	100K " "	1	VR103	915434	Solid Volume 6.8K	1
R113	915003	1K " "	1	VR301	915411	Solid Volume 330	1
R114	915341	15K " "	1	VR302 thru 306	915510	Potentiometer, Volume/ On-Off Switch/Balance Channel Select, Bass, Treble Control	4
R115	915366	33 " "	1	VR307 (a) (b)	915504	Potentiometer, Tuning/Fader Control	1
R116, 117	915044	3.3K " "	2				
R118, 119	915327	4.7K " "	2				
R120	915148	150 " 1/2W	1				
R121	915009	100 " 1/8W	1				
R122	915003	1K " "	1				

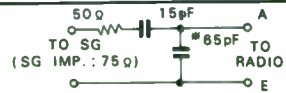
ALIGNMENT INTRUCTIONS

EQUIPMENT REQUIRED

- Signal Generator: AM 450 ~ 1700 kHz, 400 Hz Mod. @30%
FM 10.7 MHz, 86 ~ 110 MHz, 400 Hz Mod. @30% and Stereo Signal Generator
- Sweep Generator: 450 kHz, 10.7 MHz
- Antenna Pad: Refer to Fig. 1 and Fig. 3
- Indicator: Output meter (AC voltmeter or VTVM)
Oscilloscope and Frequency Counter
- Power Source Voltage: DC 13.8 V (standard voltage for measurement)

AM (I-F & RF) ALIGNMENT

- Set Volume Control at maximum, and Tone in the treble position.
- Set Band Selector Switch in the AM position.
- Set Balance Control in center.
- Connect the signal generator to the antenna receptacle through the antenna pad. (Fig. 1)
- Keep the signal generator output low enough to prevent overloading the circuit.



*Includes the feeder capacitor.
Fig. 1 Antenna Pad

	STEP	GENERATOR FREQUENCY	BAND SELECTOR SETTING	RADIO-DIAL SETTING	SIGNAL FEED POINT	INDICATOR CONNECTION	ADJUST	REMARKS
AM	① ~ ④	450 kHz [Un-modulated or 400 Hz Mod.]	AM	Point of non-interference. (on/about 600 kHz)	Through pad (Fig. 1) to antenna receptacle.	Between Point Ⓐ and ground or speaker terminals.	IFT104 IFT101	Adjust for maximum.
	⑤	510 kHz [400 Hz Mod.]	"	Low freq. end stop.	"	Output meter across speaker terminals.	L106 (OSC)	"
	⑥	1640 kHz [400 Hz Mod.]	"	High freq. end stop.	"	"	C113 (OSC)	"
	⑦ ~ ⑧	1400 kHz [400 Hz Mod.]	"	Tune to signal.	"	"	C104 (RF) C101 (ANT)	"

- When radio is installed in car, antenna fully extended, tune in a weak station near 1400 kHz and adjust C101 for maximum output.
- Refer to ANTENNA TRIMMER ALIGNMENT, page 1.
- Repeat steps two or three times.

FM (I-F & RF) ALIGNMENT

FM I-F ALIGNMENT USING FM SIGNAL GENERATOR AND SWEEP GENERATOR

- Volume, Tone and Balance Control may be left in any position.
- Set Band Selector Switch in the FM position.
- Set DX/LOCAL Selector Switch in the DX position.
- Connect the signal generator to the antenna receptacle through the antenna pad. (Fig. 3)
- Keep the signal generator output low enough to prevent overloading the circuit.

	STEP	GENERATOR FREQUENCY	RADIO-DIAL SETTING	SIGNAL FEED POINT	INDICATOR CONNECTION	ADJUST	REMARKS
FM	⑤	10.7 MHz	Point of non-interference.	Through pad (Fig. 3) to antenna receptacle.	Vert. amp of scope to point Ⓐ, low side to ground.	IFT51	Adjust for maximum amplitude and proper linearity between ±100 kHz markers. 10.7 MHz Fig. 2
	⑩ ~ ⑪	"	"	"	"	IFT151 IFT152	

- Repeat step ⑩, ⑪ & ⑫ two or three times.

FM RF ALIGNMENT

- Set Volume Control at maximum, and Tone in the treble position.
- Set Band Selector Switch in the FM position.
- Set DX/LOCAL Selector Switch in the DX position.
- Set Balance Control in center.
- Connect the signal generator to the antenna receptacle through the antenna pad. (Fig. 3)
- Keep the signal generator output enough to prevent overloading the circuit.

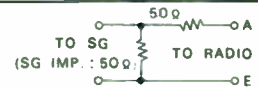


Fig. 3 Antenna Pad

	STEP	GENERATOR FREQUENCY	RADIO-DIAL SETTING	SIGNAL FEED POINT	INDICATOR CONNECTION	ADJUST	REMARKS
FM	⑫	87.0 MHz [400 Hz Mod.]	Low freq. end stop.	Through pad (Fig. 3) to antenna receptacle.	Output meter across speaker terminals.	C75 (OSC)	Adjust for maximum. Repeat steps two or three times.
	⑬ ~ ⑭	98.0 MHz [400 Hz Mod.]	Tune to signal.	"	"	C65 (RF) C58 (ANT)	

- In the step ⑬, adjust lower frequency at 87.0 MHz. The upper frequency will be within 108 ~ 110 MHz, because of design characteristics. It is nonadjustable.

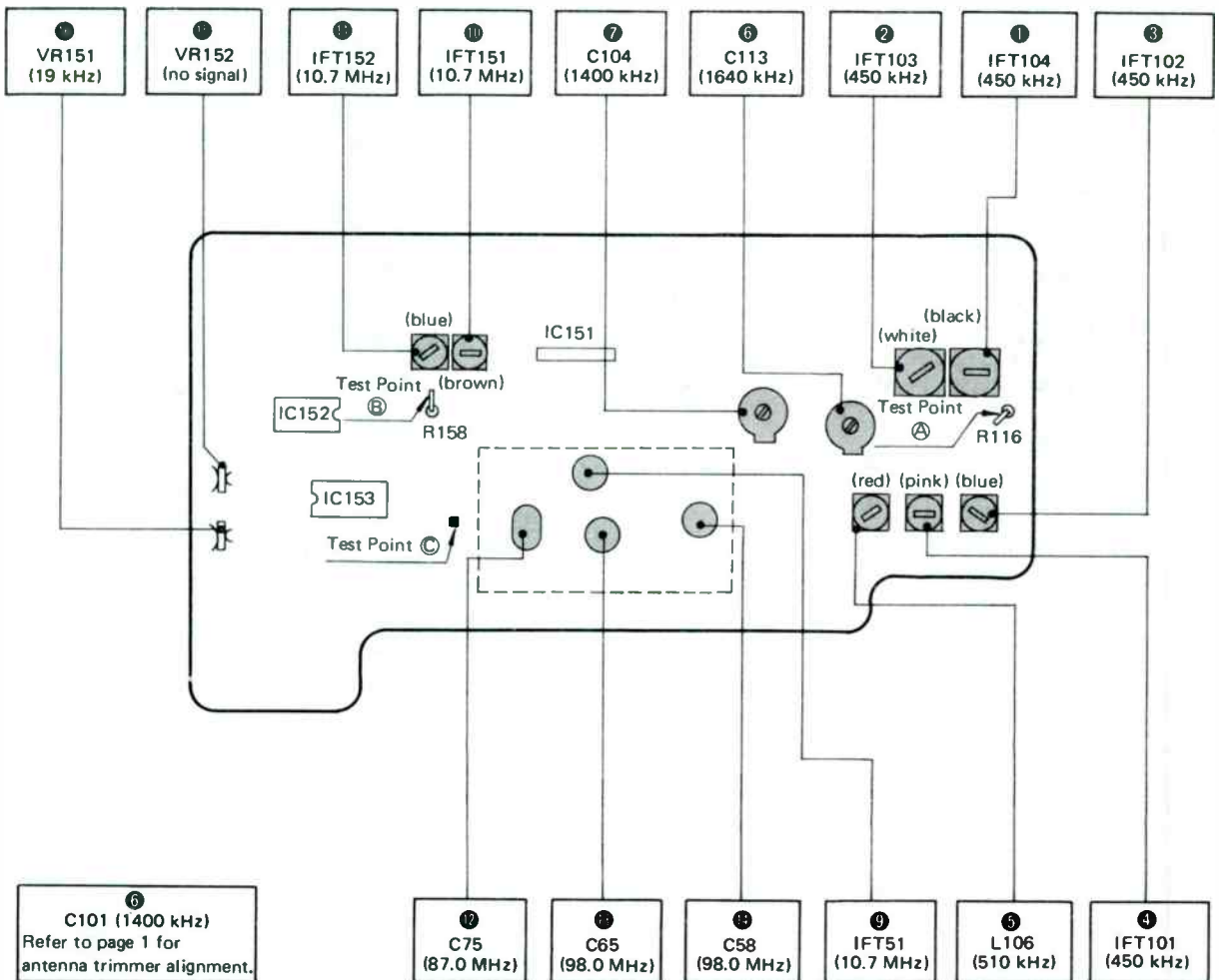
MULTIPLEX ALIGNMENT USING FM SIGNAL GENERATOR AND STEREO SIGNAL GENERATOR

- Set Volume Control at maximum, and Tone in the treble position.
- Set Balance Control in center.
- Set DX/LOCAL Selector Switch in the DX position.
- Connect the signal generator to the antenna receptacle through the antenna pad. (Fig. 3)
- Keep the signal generator output low enough to prevent overloading the circuit.
- FM signal generator should be modulated by the stereo signal generator.
 - Modulation Level: 19 kHz, 10%
 - 400 Hz, 30%
 - FM signal generator output level: 1 mV
 - FM signal generator frequency: 98 MHz

STEP	MODULATION FREQUENCY	INDICATOR	ADJUST	REMARKS	
FM M P X	1	No signal input	Frequency counter to Test Point ③, low side to ground.	VR152	Adjust to 19 kHz \pm 30 Hz.
	2	19 kHz, 400 Hz (Right Channel)	VTVM to right speaker terminals.	VR151	Adjust for minimum.
		19 kHz, 400 Hz (Left Channel)	VTVM to left speaker terminals.		Adjust for minimum.

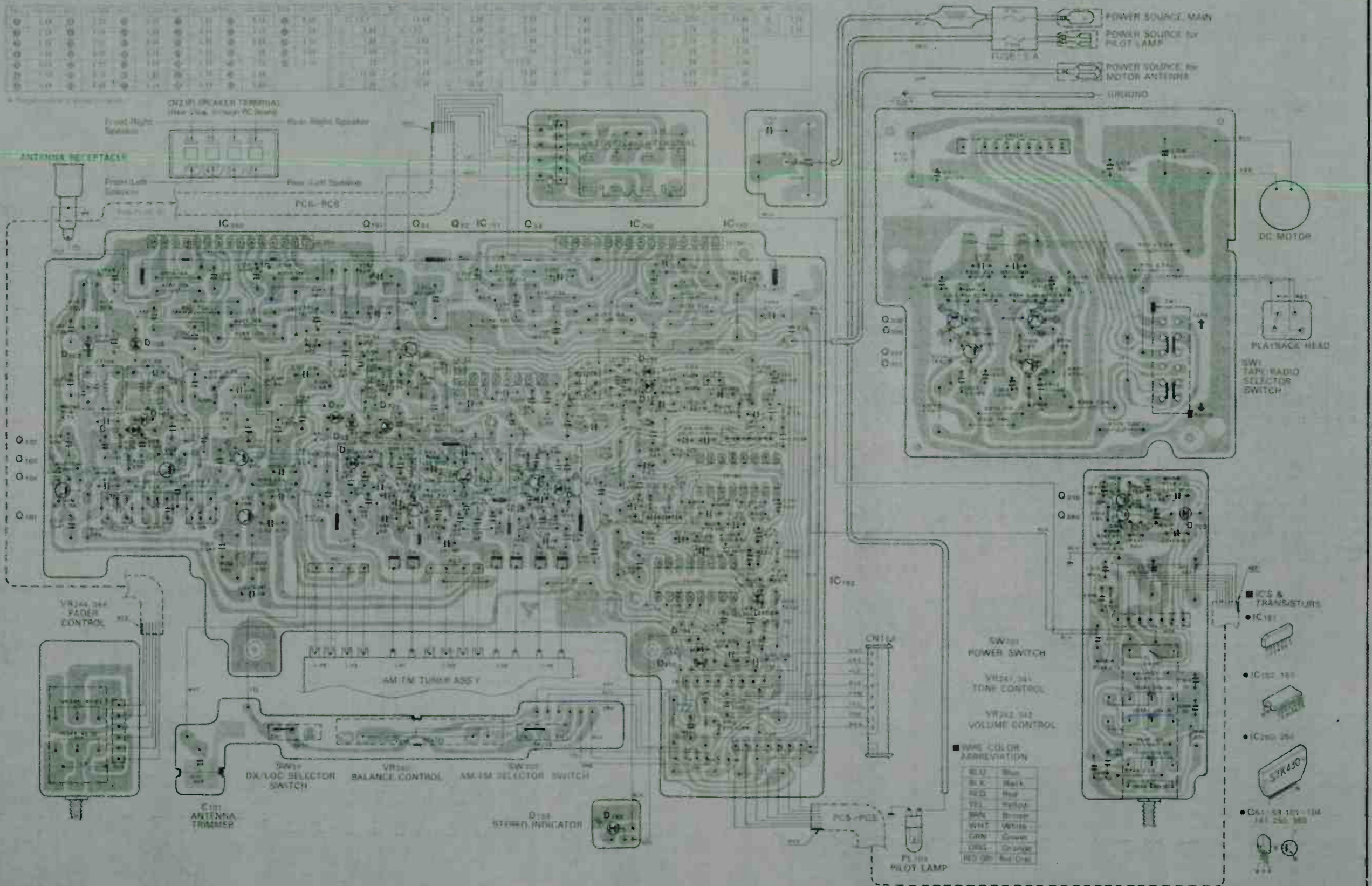
- Repeat steps two or three times.

- NOTES: 1) Test Point ① is negative side of C119 in the line of R116.
 2) Test Point ② is the R158 in the line of R165.
 3) Test Point ③ is the terminal No. 12 of IC153.



- Numbers in ● are indicated ALIGNMENT STEPS.

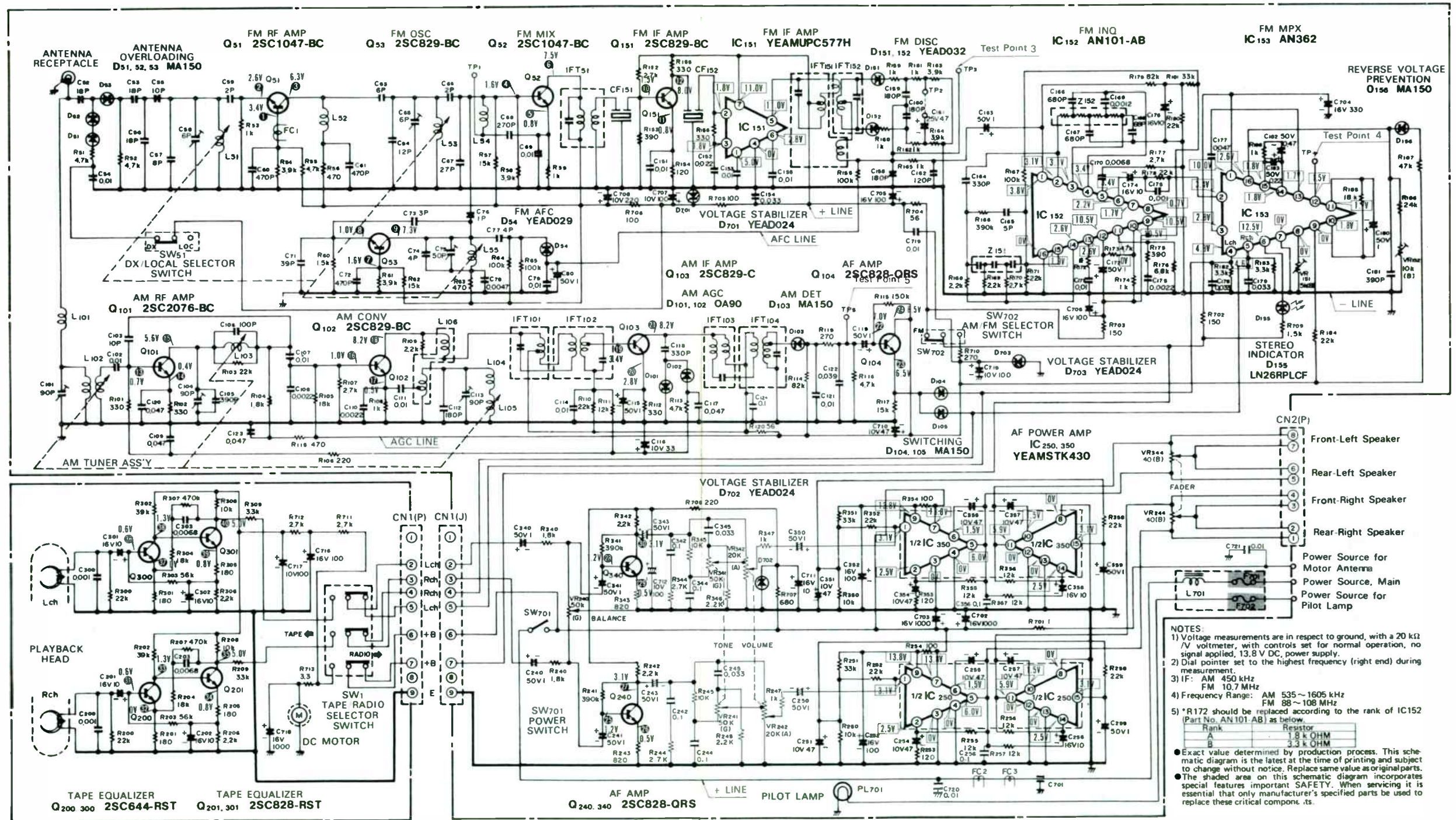
WIRING DIAGRAM MODELS CQ-3711EU/EC, 3712EU/EC



CASSETTE CAR STEREO w/AM/FM/FM MPX RADIO

Panasonic CQ-3711EU, EC/3712EU, EC

SCHEMATIC DIAGRAM MODELS CQ-3711EU/EC, 3712EU/EC



NOTES:
 1) Voltage measurements are in respect to ground, with a 20 kΩ 1V voltmeter, with controls set for normal operation, no signal applied, 13.8V DC, power supply.
 2) Dial pointer set to the highest frequency (right end) during measurement.
 3) IF: AM 450 kHz FM 10.7 MHz
 4) Frequency Range: AM 535~1605 kHz FM 88~108 MHz
 5) *R172 should be replaced according to the rank of IC152 (Part No. AN101-AB) as below.

Rank	Resistor
A	1.8 k OHM
B	3.3 k OHM

Exact value determined by production process. This schematic diagram is the latest at the time of printing and subject to change without notice. Replace same value as original parts.
 The shaded area on this schematic diagram incorporates special features important SAFETY. When servicing it is essential that only manufacturer's specified parts be used to replace these critical components.

51	52	302	102	308	53	54	55	56	61	109	57	58	59	110	111	152	155	113	156	120	119	150	161	163	168	166	170	167	172	173	179	181	168	183	185	187									
R	300	101	202	204	205	209	712	713	108	62	63	64	65	340	240	341	112	154	346	705	347	114	351	158	160	162	164	710	169	357	256	257	701	174	175	176	180	182	184	186					
C	101	300	301	120	302	105	123	717	716	110	111	74	75	340	79	80	708	151	707	342	153	121	122	119	121	165	161	355	715	357	355	715	357	358	706	172	173	174	175	176	177	178	179	180	181

CASSETTE CAR STEREO w/AM/FM/FM MPX RADIO

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
TAPE DECK PARTS				
HEAD				
H	(4-B)	YEAH1542YA	Playback Head	1
MECHANICAL PARTS				
M201	(3-C)	YASAK01035	DC Motor Ass'y (w/Pulley)	1
M202	(4-B)	YEFX018025	Head Base Ass'y	1
M203	(3-B)	YEFX007149	Cord Clamper	1
M204	(4-C)	YEAJ18091	Head Shielded Wire	1
M205	(4-B)	YEFX005263A	Head Azimuth Adjustment Spring	1
M206	(3-C)	YEFA01260	Main Chassis Sub Ass'y	1
M207	(4-B)	YEFX21B14BA	Pinch Roller Ass'y	1
M208	(3-A)	YEP0FX079	Eject Hook Ass'y	1
M209	(2-A)	YEFX046232	Idler Selector Sub Ass'y	1
M210	(2-A)	YEFX003073	Idler Gear	1
M211	(4-C)	YEP0FX080	SW Selector Plate Ass'y	1
M212	(2-B)	YEP0FX083	Idler Arm Ass'y	1
M213	(2-B)	YEP0FX085	FR Lever Ass'y	1
M214	(3-A)	YEFX046231	Retainer Plate A Sub Ass'y	1
M215	(4-A)	YEFX030020A	Timing Stopper	1
M216	(4-A)	YEFX030023	Slide Plate Stopper	1
M217	(4-A)	YEFX005351	Timing Stopper Spring	1
M218	(4-A)	YEFX005345	Slide Plate Stopper Spring	1
M219	(4-A)	YEFX00535B	Slide Spring	1
M220		YEJE01004	E-ring	13
M221	(2-C)	YEP0FX084	Retainer Plate B Ass'y	1
M222	(3-C)	YEFK06036	Cassette Holder Sub Ass'y	1
M223	(3-C)	YEFK06035	Guide Holder Sub Ass'y	1
M224	(3-C)	YEFX235103	Tape Guide A	1
M225	(3-C)	YEFX235104	Tape Guide B	1

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
M226	(4-C)	YEP0FX082	Charge Plate Ass'y	1
M227	(1-B)	YEFX209130	Reel Plate Sub Ass'y	1
M228	(1-B)	YEFX046215	FR Slide Plate	1
M229	(2-B)	YEFX046214	FF Plate	1
M230	(1-B)	YEFX046213	REW Plate	1
M231	(1-A)	YEFX003072	FF Gear	1
M232	(2-A)	YEFX003071	REW Gear	1
M233	(1-A)	YEFX209131	Reel Base Ass'y (Supply)	1
M234	(2-A)	YEFX005363	FF Spring	1
M235	(1-B)	YEFX005346	REW Spring	1
M236	(2-A)	YEFX014008	Snap Ring	3
M237	(1-A) (1-B)	YEFX014007	Snap Ring	2
M238	(2-B)	YEFX234114	FR Selector Cam	1
M239	(2-B)	YEFX04621B	FR Release Plate A	1
M240	(2-B)	YEFX046217	FR Release Plate B	1
M241	(2-A)	YEFW06341	Eject Shaft	1
M242	(2-B)	YEFX00534B	Eject Shaft Spring	1
M243	(2-B)	YEFX005353	FR Release Spring	1
M244	(4-B)	YEFX046226	Eject Plate	1
M245	(3-B)	YEFX030022	Stopper	1
M246	(3-B)	YEFX005352	Stopper Spring	1
M247	(2-C)	YEFX030021	Head Base Stopper	1
M248	(2-C)	YEFX005359	Lock Plate Spring	1
M249	(3-A)	YEFX213126	Flywheel	1
M250	(3-A)	YAJW05011	Polyslider	1
M251	(2-A)	YEFR03025	Drive Belt	1
M252	(4-B)	YEFX005354	Head Base Spring	1
M253	(3-A)	YEFX005356	Cassette Holder Spring	1
M254	(3-A)	YEFX005355	Pop Up Spring	1
M255	(4-A)	YEFX005357	Eject Spring	1
M256	(3-B)	YEFX005347	FR Lock Spring	1
M257	(2-B)	YEFX005350A	Idler Arm Spring	1
M258	(4-A)	YEFX005349	Eject Hook Spring	1
M259	(2-B)	YEJE01003	E-ring	1

Panasonic CQ-3711EU, EC/3712EU, EC

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
M260 (2-B)	YEJE01009	E-ring	1	
M261	XYN26 + C4FXS	⊗ Screw w/Washer, 2.6mmφ x 4mm	5	
M262	XS826 + 6FXS	⊗ Screw, Bind 2.6mmφ x 6mm	4	
M263	XSN2 + 4FXS	⊗ Screw, Pan 2mmφ x 4mm	1	
M264	XYN2 + C5FXS	⊗ Screw w/Washer, 2mmφ x 5mm	1	
M265 (1-B)	YEFX209132	Reel Base Ass'y (FF)	1	
M266 (4-A)	YEFX005379	Hook Spring	1	

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
ICs				
RADIO BLOCK				
IC151	YEAMUPC577H	FM IF AMP	1	
IC152	AN101	FM INQ	1	
IC153	AN362	FM MPX AMP	1	
IC250, 350	YEAMSTK430	AF Power AMP	2	
TRANSISTORS				
RADIO BLOCK				
Q51, 52	2SC1047	FM RF AMP, FM Mix	2	
Q53, 102, 151 103	2SC829	FM OSC, AM Conv., FM IF AMP, AM IF AMP	4	
Q101	2SC2076	AM RF AMP	1	
Q104, 240, 340	2SC828	AF AMP	3	
PRE AMP BLOCK				
Q200, 300	2SC644	Pre AMP	2	
Q201, 301	2SC828	Pre AMP	2	

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
DIODES				
RADIO BLOCK				
D51, 52, 53	MA150	Over-Loading	7	
103, 104, 105		AM Det		
156		Reverse Voltage Prevention		
D54	YEAD029	FM AFC	1	
D101, 102	OA90	AM AGC	2	
D151, 152	YEAD032	FM DISC	2	
D155	LN26RPLCF	Stereo Indicator	1	
D701, 702, 703	YEAD024	Voltage Stabilizer	3	
CAPACITORS				
RADIO BLOCK				
C52	YECCD1H180KM	18 PF 50WV ±10% Ceramic	1	
C53	YECCD1H180KM	18 PF 50WV ±10% Ceramic	1	
C54	ECKD1H103PF	0.01 MFD 50WV +100, -0% Ceramic	1	
C55	YECCD1H100JS	10 PF 50WV ±5% Ceramic	1	
C56	YECCD1H180KM	18 PF 50WV ±10% Ceramic	1	
C57	YECCD1H080DS	8 PF 50WV ±0.5 PF Ceramic	1	
C59	YECCD1H020CM	2 PF 50WV ±0.25 PF Ceramic	1	
C60	YECKD05471K	470 PF 50WV ±10% Ceramic	1	
C61	YECKD05471K	470 PF 50WV ±10% Ceramic	1	
C63	YECCD1H060DM	6 PF 50WV ±0.5 PF Ceramic	1	
C64	YECCD1H120JU	12 PF 50WV ±5% Ceramic	1	
C66	YECCD1H020CM	2 PF 50WV ±0.25 PF Ceramic	1	
C67	YECCD1H270KM	27 PF 50WV ±10% Ceramic	1	
C68	YECCD1H271JM	270 PF 50WV ±5% Ceramic	1	
C69	YECKD05103Z	0.01 MFD 50WV +80, -20% Ceramic	1	
C71	YECCD1H390KM	39 PF 50WV ±10% Ceramic	1	

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
C72	YECKD05471K	470 PF 50WV ±10% Ceramic	1	
C73	YECCD1H030DU	3 PF 50WV ±0.5 PF Ceramic	1	
C74	YECCD1H040DU	4 PF 50WV ±0.5 PF Ceramic	1	
C76	YECCD1H010CM	1 PF 50WV ±0.25 PF Ceramic	1	
C77	YECCD1H040DU	4 PF 50WV ±0.5 PF Ceramic	1	
C78	YECQN1H472K	0.0047 MFD 50WV ±10% Polyester	1	
C79	YECKD05103Z	0.01 MFD 50WV +80, -20% Ceramic	1	
C80	ECEA50V1L	1 MFD 50WV Electrolytic	1	
C102	ECKD1H103PF	0.01 MFD 50WV +100, -0% Ceramic	1	
C103	YECCD1H100FM	10 PF 50WV ±1 PF Ceramic	1	
C105	YECCD1H391KM	390 PF 50WV ±10% Ceramic	1	
C106	YECCD1H101KM	100 PF 50WV ±10% Ceramic	1	
C107	YECQN1H103M	0.01 MFD 50WV ±20% Polyester	1	
C108	YECQN1H222K	0.0022 MFD 50WV ±10% Polyester	1	
C109	YECQN1H473M	0.047 MFD 50WV ±20% Polyester	1	
C110	YECQN1H222K	0.0022 MFD 50WV ±10% Polyester	1	
C111	YECQN1H103M	0.01 MFD 50WV ±20% Polyester	1	
C112	YECCD1H181KT	180 PF 50WV ±10% Ceramic	1	
C114	YECQN1H103M	0.01 MFD 50WV ±20% Polyester	1	
C115	ECEA50V1L	1 MFD 50WV Electrolytic	1	
C116	ECEA16V33L	33 MFD 16WV Electrolytic	1	
C117	YECQN1H473M	0.047 MFD 50WV ±20% Polyester	1	
C118	YECCD1H331KM	330 PF 50WV ±10% Ceramic	1	
C119	ECEA50V1L	1 MFD 50WV Electrolytic	1	
C120	YECQN1H473M	0.047 MFD 50WV ±20% Polyester	1	
C121	YECQN1H103M	0.01 MFD 50WV ±20% Polyester	1	
C122	YECQN1H393M	0.039 MFD 50WV ±20% Polyester	1	
C123	YECQN1H473M	0.047 MFD 50WV ±20% Polyester	1	
C124	YECQN1H104M	0.1 MFD 50WV ±20% Polyester	1	
C151	ECKD1H103PF	0.01 MFD 50WV +100, -0% Ceramic	1	
C152	YECQN1H223M	0.022 MFD 50WV ±20% Polyester	1	
C153	YECKD05103Z	0.01 MFD 50WV +80, -20% Ceramic	1	
C154	YECQN1H333M	0.033 MFD 50WV ±20% Polyester	1	
C155	YECKD05103Z	0.01 MFD 50WV +80, -20% Ceramic	1	

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
C158	YECCD1H181KM	180 PF 50WV ±10% Ceramic	1	
C159	YECCD1H181KM	180 PF 50WV ±10% Ceramic	1	
C160	YECCD1H181KM	180 PF 50WV ±10% Ceramic	1	
C161	ECEA25V4R7L	4.7 MFD 25WV Electrolytic	1	
C162	YECCD1H121KM	120 PF 50WV ±10% Ceramic	1	
C163	ECEA50V1L	1 MFD 50WV Electrolytic	1	
C164	YECCD1H331KM	330 PF 50WV ±10% Ceramic	1	
C165	YECCD1H050DM	5 PF 50WV ±0.5 PF Ceramic	1	
C166	ECQS1681JZ	680 PF 125WV ±5% Polystyrene	1	
C167	ECQS1681JZ	680 PF 125WV ±5% Polystyrene	1	
C168	YECQN1H122K	0.0012 MFD 50WV ±10% Ceramic	1	
C169	YECCD1H680KM	68 PF 50WV ±10% Ceramic	1	
C170	YECQN1H682M	0.0068 MFD 50WV ±20% Polyester	1	
C171	YECQN1H103M	0.01 MFD 50WV ±20% Polyester	1	
C172	ECEA50V1L	1 MFD 50WV Electrolytic	1	
C173	YECQN1H222K	0.0022 MFD 50WV ±10% Polyester	1	
C174	ECEA16V10L	10 MFD 16WV Electrolytic	1	
C175	YECQN1H102K	0.001 MFD 50WV ±10% Polyester	1	
C176	ECEA16V10L	10 MFD 16WV Electrolytic	1	
C177	YECQN1H473M	0.047 MFD 50WV ±20% Polyester	1	
C178	YECQN1H333M	0.033 MFD 50WV ±20% Polyester	1	
C179	YECQN1H333M	0.033 MFD 50WV ±20% Polyester	1	
C180	ECEA50V1L	1 MFD 50WV Electrolytic	1	
C181	ECQS1391JZ	390 PF 125WV ±5% Polystyrene	1	
C182	ECEA50MR47	0.47 MFD 50WV Electrolytic	1	
C183	ECEA50MR22	0.22 MFD 50WV Electrolytic	1	
C240	ECEA50V1L	1 MFD 50WV Electrolytic	1	
C241	ECEA50V1L	1 MFD 50WV Electrolytic	1	
C242	YECCD12104M	0.1 MFD 12WV ±20% Ceramic	1	
C243	ECEA50V1L	1 MFD 50WV Electrolytic	1	
C244	ECSF35ER1	0.1 MFD 35WV Tantalum	1	
C245	YECQN1H333M	0.033 MFD 50WV ±20% Polyester	1	
C250	ECEA50V1L	1 MFD 50WV Electrolytic	1	
C251	ECEA10V47L	47 MFD 10WV Electrolytic	1	

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
C252	ECEA16V100L	100 MFD 16WV Electrolytic	1	
C254	ECEA10V47L	47 MFD 10WV Electrolytic	1	
C255	ECEA10V47L	47 MFD 10WV Electrolytic	1	
C256	YECCD12104M	0.1 MFD 12WV ±20% Ceramic	1	
C257	ECEA10V47L	47 MFD 10WV Electrolytic	1	
C258	ECEA16V10L	10 MFD 16WV Electrolytic	1	
C259	ECEA50V1L	1 MFD 50WV Electrolytic	1	
C340	ECEA50V1L	1 MFD 50WV Electrolytic	1	
C341	ECEA50V1L	1 MFD 50WV Electrolytic	1	
C342	YECCD12104M	0.1 MFD 12WV ±20% Ceramic	1	
C343	ECEA50V1L	1 MFD 50WV Electrolytic	1	
C344	ECSF35ER1	0.1 MFD 35WV Tantalum	1	
C345	YECQN1H333M	0.033 MFD 50WV ±20% Polyester	1	
C350	ECEA50V1L	1 MFD 50WV Electrolytic	1	
C351	ECEA10V47L	47 MFD 10WV Electrolytic	1	
C352	ECEA16V100L	100 MFD 16WV Electrolytic	1	
C354	ECEA10V47L	47 MFD 10WV Electrolytic	1	
C355	ECEA10V47L	47 MFD 10WV Electrolytic	1	
C356	YECCD12104M	0.1 MFD 12WV ±20% Ceramic	1	
C357	ECEA10V47L	47 MFD 10WV Electrolytic	1	
C358	ECEA16V10L	10 MFD 16WV Electrolytic	1	
C359	ECEA50V1L	1 MFD 50WV Electrolytic	1	
C701	YECCL510355	1000 PF Feedthrough	1	
C702	ECEA16V1000Z	1000 MFD 16WV Electrolytic	1	
C703	ECEA16V1000Z	1000 MFD 16WV Electrolytic	1	
C704	ECEA16V330L	330 MFD 16WV Electrolytic	1	
C705	ECEA16V100L	100 MFD 16WV Electrolytic	1	
C706	ECEA16V100L	100 MFD 16WV Electrolytic	1	
C707	ECEA10V100L	100 MFD 10WV Electrolytic	1	
C708	ECEA10V220L	220 MFD 10WV Electrolytic	1	
C710	ECEA10V47L	47 MFD 10WV Electrolytic	1	
C711	ECEA16V10L	10 MFD 16WV Electrolytic	1	
C712	ECEA10V100L	100 MFD 10WV Electrolytic	1	
C715	ECEA10V100L	100 MFD 10WV Electrolytic	1	

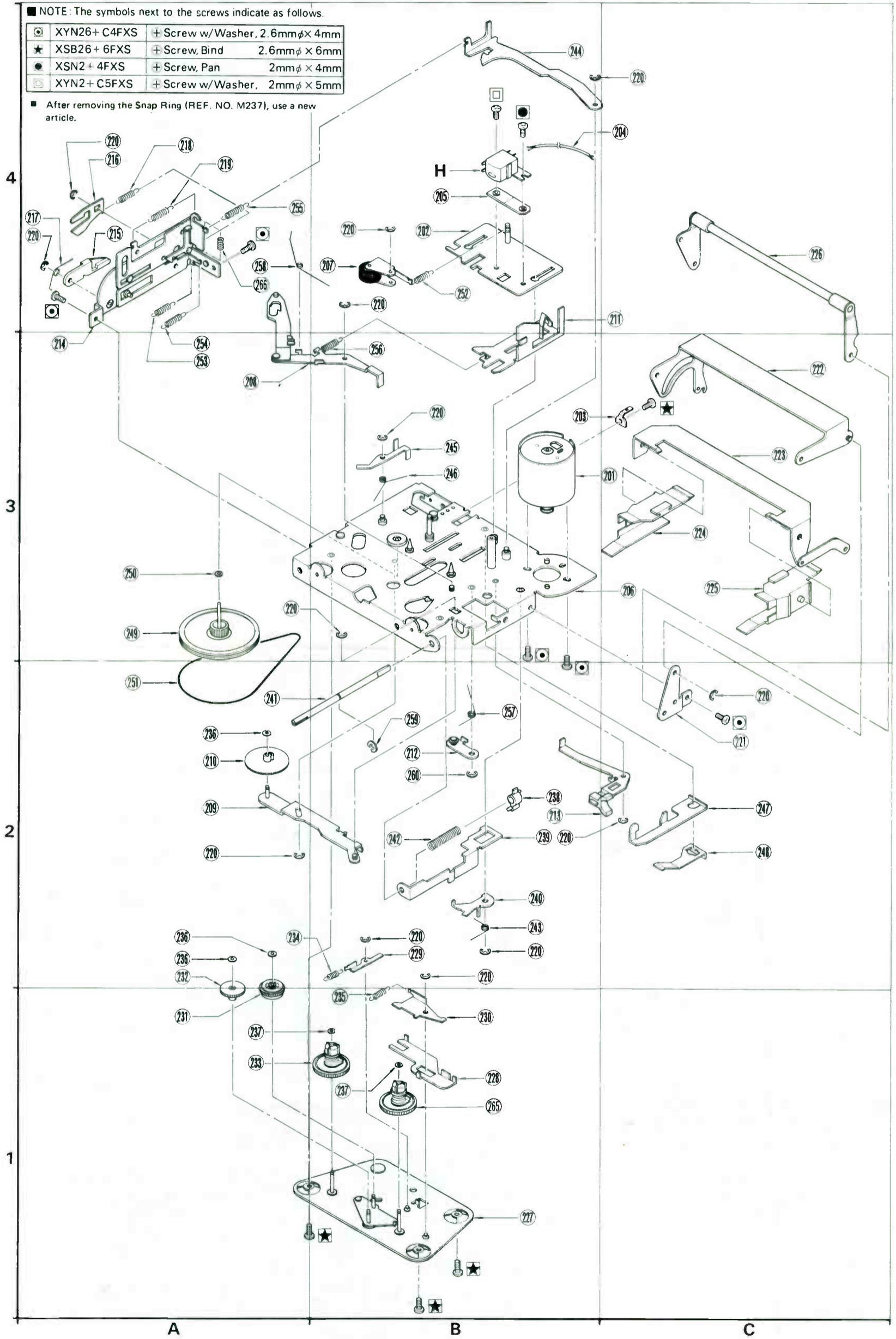
EXPLODED VIEW (TAPE DECK)

Numbers in \bigcirc are indicated REF. NO. in the REPLACEMENT PARTS LIST.

NOTE: The symbols next to the screws indicate as follows.

\bigcirc XYN26+ C4FXS	+ Screw w/Washer, 2.6mm ϕ × 4mm
\star XSB26+ 6FXS	+ Screw, Bind 2.6mm ϕ × 6mm
\bullet XSN2+ 4FXS	+ Screw, Pan 2mm ϕ × 4mm
\square XYN2+ C5FXS	+ Screw w/Washer, 2mm ϕ × 5mm

After removing the Snap Ring (REF. NO. M237), use a new article.



Panasonic CQ-3711EU, EC13712EU, EC

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
C719	YEQN1H103M	0.01 MFD 50WV ±20% Polyester	1	
C720	YECKD05103Z	0.01 MFD 50WV +80, -20% Ceramic	1	
C721	YECKD05103Z	0.01 MFD 50WV +80, -20% Ceramic	1	

PRE AMP BLOCK

C200	YEQN1H102K	0.001 MFD 50WV ±10% Polyester	1	
C201	ECEA16V10L	10 MFD 16WV Electrolytic	1	
C202	ECEA16V10L	10 MFD 16WV Electrolytic	1	
C203	YEQN1H6B2M	0.0068 MFD 50WV ±20% Polyester	1	
C300	YEQN1H102K	0.001 MFD 50WV ±10% Polyester	1	
C301	ECEA16V10L	10 MFD 16WV Electrolytic	1	
C302	ECEA16V10L	10 MFD 16WV Electrolytic	1	
C303	YEQN1H6B2M	0.0068 MFD 50WV ±20% Polyester	1	
C716	ECEA16V100L	100 MFD 16WV Electrolytic	1	
C717	ECEA10V100L	100 MFD 10WV Electrolytic	1	
C718	ECEA16V1000Z	1000 MFD 16WV Electrolytic	1	

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
IFT151	YE1F07S7048	FM IFT	1	
IFT152	YE1F07S7047	FM IFT	1	
CF151, 152	YE1N09N5007	Ceramic Filter	2	
FC1, 2, 3	YEAZ05BRH002	Ferrite Core	3	

SWITCHES

SW51	YEAS07059	DX/LOCAL Selector Switch	1	
SW702	YEAS07059	AM/FM Selector Switch	1	
SW1	YEAS07026	Tape/Radio Selector Switch	1	

Ref. No.	Part No.	Part Name & Description	Pcs Set	Remarks
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VARIABLE CAPACITORS

C5B, 65	ECV1ZW06X32	6 PF Trimmer	2	
C75	YECTAT1397	50 PF Trimmer	1	
C101, 104, 113	YECTT1090	90 PF Trimmer	3	

VARIABLE RESISTORS

VR151	EVNJ0AA00B53	5k OHM (B) Semi-fixed	1	
VR152	EVNJ0AA00B14	10k OHM (B) Semi-fixed	1	
VR240	EVAHH1S10G54	50k OHM (G) Balance Control	1	
VR241, 341	EWKPUBS09908	20k OHM (A) Volume Control	1	
242, 342		50k OHM (G) Tone Control		
w/SW701		with Power Switch		
VR244, 344	EVMXXAS43BB1	40 OHM (B) Fader Control	1	

COILS, TRANSFORMERS AND CERAMIC FILTERS

L52	YELT04C5R6K	FM RF Coil	1	
L54	YELT03C011	FM RF Coil	1	
L101	YELT04C8R2K	Loading Coil	1	
L104	YELT06N5R6	AM RF Coil	1	
L106	YELL07S069	AM OSC Coil	1	
IFT51	YE1F07S7049	FM IFT	1	
IFT101	YE1A07S7076A	AM IFT	1	
IFT102	YE1A07S7077B	AM IFT	1	
IFT103	YE1A10S7091	AM IFT	1	
IFT104	YE1A10S7092	AM IFT	1	

Panasonic CQ-3711EU, EC/3712EU, EC

Pages 86-89 Courtesy of PIONEER ELECTRONICS of AMERICA

IF/MPX UNIT (CWE-179)

● **Parts List**

MISCELLANEOUS

Ref. Key	Parts No.	Description	Ref. Key	Parts No.	Description
IC1	CWW-011	IC and Ceramic Filter	L2	CTC-056	IF Transformer
IC2	HA1137P	IC	L3	CTC-055	IF Transformer
IC3	K84409	IC	L4	CTC-057 or	Coil, 18mH
IC4	H8D1147 or	IC		CTC-058	Coil, 18mH
	LAC010	IC	VR1	C92-618	Volume, 4.7kΩ (8)
Q1	2SC828-P,Q,R	Transistor	VR2	C92-618	Volume, 4.7kΩ (8)
Q2	2SC828-P,Q,R	Transistor			
Q3	2SA733-P,Q,R	Transistor			
Q4	2SC1383-Q,R	Transistor			
D1	1S2076 or	Diode			
	1S1555	Diode			
D2	1S2076 or	Diode			
	1S1555	Diode			
D4	WZ-094	Diode			
L1	CTF-016	Ferri-Inductor, 15μH			

IF/MPX UNIT (CWE-179)

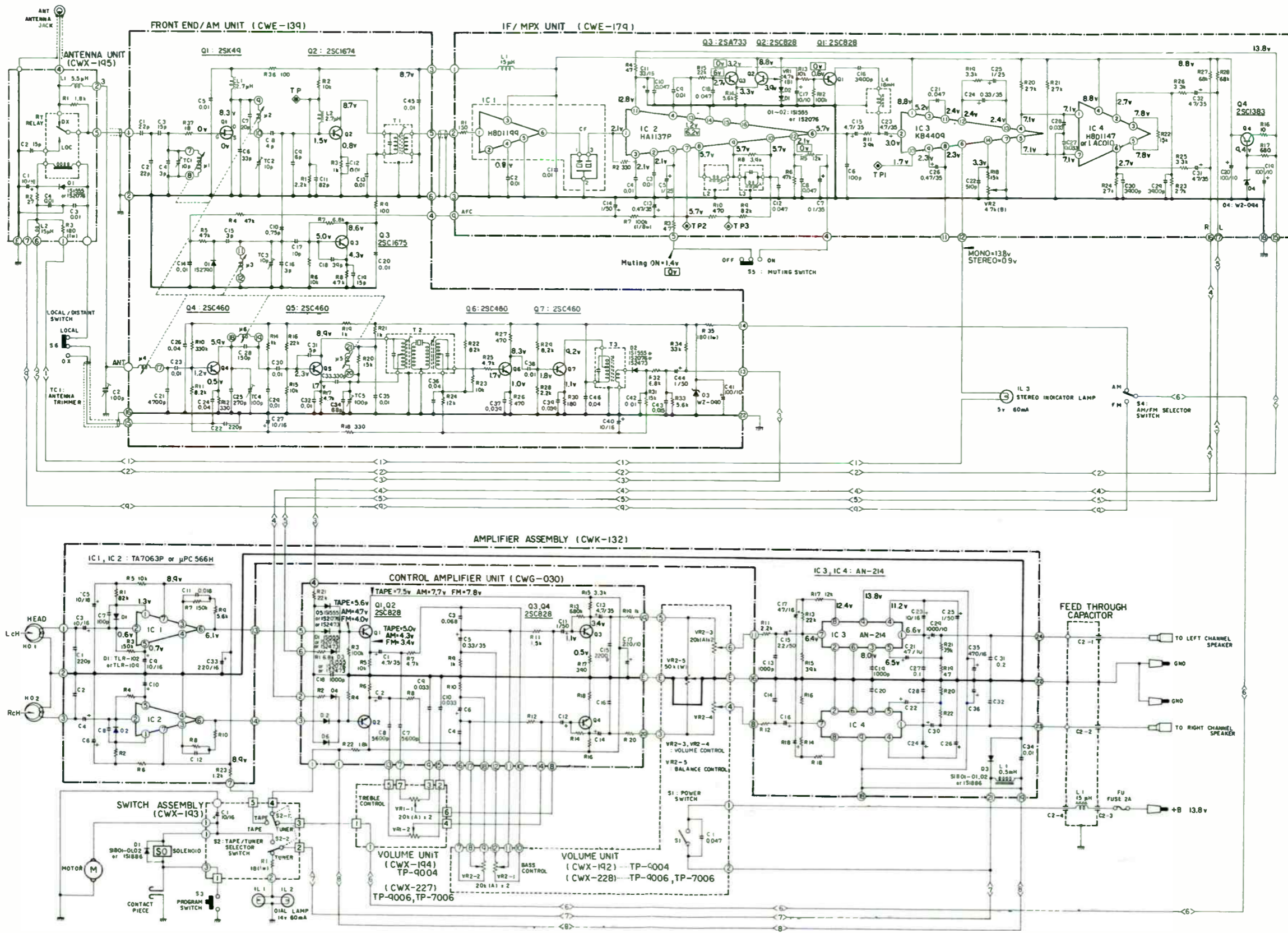
CAPACITORS

Ref. Key	Parts No.	Description	Ref. Key	Parts No.	Description
C1	CKDYD103M50	Capacitor 0.01μF 50V	C18	CKDYF473Z25	Capacitor 0.047μF 25V
C2	CKDYD103M50	Capacitor 0.01μF 50V	C19	CEA101P10	Capacitor 100μF 10V
C3	CKDYD103M50	Capacitor 0.01μF 50V	C20	CEA101P10	Capacitor 100μF 10V
C4	CKDYD103M50	Capacitor 0.01μF 50V	C21	CQMA473K50	Capacitor 0.047μF 50V
C5	CSZA010M25	Capacitor 1μF 25V	C22	CQSA511J50	Capacitor 510pF 50V
C6	CCDSL101K50	Capacitor 100pF 50V	C23	CEA4R7P35	Capacitor 4.7μF 35V
C7	CSZA0R1M35	Capacitor 0.1μF 35V	C24	CSZAR33M35	Capacitor 0.33μF 35V
C8	CKDYF473Z25	Capacitor 0.047μF 25V	C25	CSZA010M25	Capacitor 1μF 25V
C9	CKDYD103M50	Capacitor 0.01μF 50V	C26	CSZAR47M35	Capacitor 0.47μF 35V
C10	CKDYF473Z25	Capacitor 0.047μF 25V	C27	CQMA333K50	Capacitor 0.033μF 50V
C11	CEA330P16	Capacitor 33μF 16V	C28	CQMA333K50	Capacitor 0.033μF 50V
C12	CKDYF473Z25	Capacitor 0.047μF 25V	C29	CQMA392K50	Capacitor 3900pF 50V
C13	CSZAR47M35	Capacitor 0.47μF 35V	C30	CQMA392K50	Capacitor 3900pF 50V
C14	CEA010P50	Capacitor 1μF 50V	C31	CEA4R7P35	Capacitor 4.7μF 35V
C15	CEA4R7P35	Capacitor 4.7μF 35V	C32	CEA4R7P35	Capacitor 4.7μF 35V
C16	CQSA392J50	Capacitor 3900pF 50V			
C17	CSZA100M10	Capacitor 10μF 10V			

1. SCHEMATIC CIRCUIT DIAGRAM

TP-9004
TP-7006
TP-9006

NOTICE: Power Voltage is a measuring value in the position (non-signal position) attaching FM Front End unit.
And Voltage in a mark is a measuring value in the position adding the input signal in 60 dB.



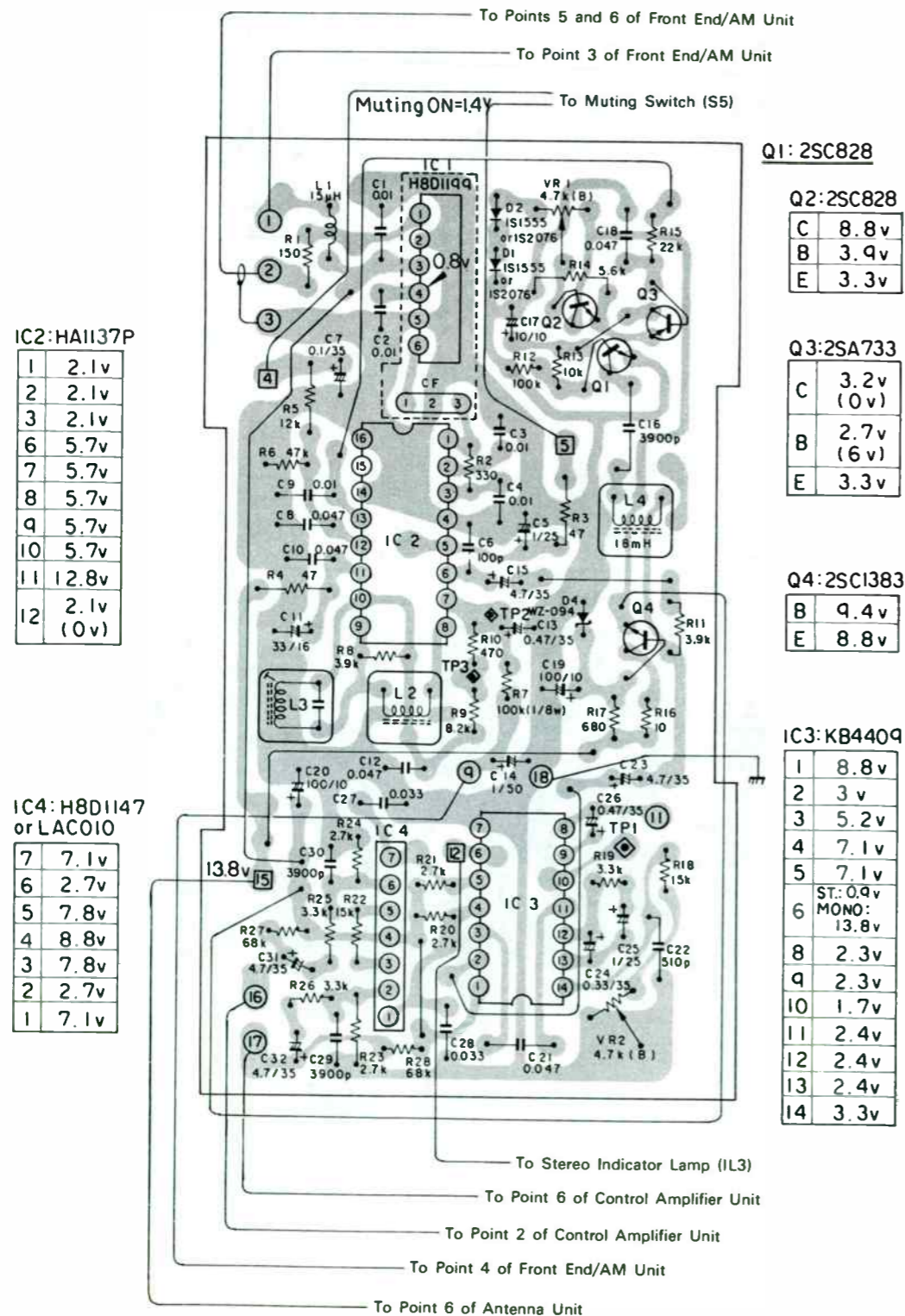
2. IF/MPX UNIT (CWE-179)

Pioneer TP-7006,9004/6

● Parts Connection

NOTICE: Power Voltage is a measuring value in the position (non-signal position) attaching FM Front End unit.

And Voltage in a mark () is a measuring value in the position adding the input signal in 60 dB.



5. AM/FM MPX ALIGNMENT PROCEDURE

Step	Signal Source	Output Indicator	Set Signal to	Set Radio Dial to	Adjust-	Adjust for
1	Set Function Switch to MW and Local-DX Switch to DX.					
2	Sweep Gen. connected to TP5, (Fig. 15) & chassis placed nearest to TP5.	Sweep Gen. connected to TP4 (R418) & chassis placed nearest to TP4.	455 kHz	Quiet point on band	Adj 1 (T401)	Fig. 9
3	Signal Gen. or Sweep Gen. connected to antenna terminal through dummy antenna. (Fig. 10)	VTVM or Sweep Gen. connected to TP4 & chassis placed nearest to TP4.	505 kHz	505 kHz Turning knob fully clockwise.	Adj 2 (CT402)	Maximum
4			1650 kHz	1650 kHz Turning knob fully clockwise.	Adj 3 (CT402)	
5			1400 kHz	1400 kHz	Adj 4 (CT401, CT403)	
6	Repeat Steps 2 through 5 if necessary to obtain maximum sensitivity.					
7	Set function switch to FM and Local-DX switch to DX.					
8	Sweep Gen. connected to TP1 (Fig. 15) and chassis placed nearest TP1.	Sweep Gen. connected to TP2 (R324) & chassis to TP2.	10.7 MHz	Quiet point on band	Adj 5 (T301)	Fig. 11
9					Adj 6 (T302)	Fig. 12
10	Sig. Gen. or Sweep Gen. connected to antenna terminal through dummy antenna. (Fig. 13)	Sweep Gen. connected to TP2 & chassis placed nearest to TP2.	87.5 MHz	Turning knob fully counter-clockwise.	Adj 7 (CT302)	Maximum
11			106 MHz	106 MHz (Mark between 104 MHz & 108 MHz)	Adj 8 (CT301) Adj 9 (CT303)	Maximum
12	Repeat steps 8 through 11 if necessary to obtain maximum sensitivity.					
13	Sig. Gen. connected to antenna terminal through dummy antenna (Fig. 13)	Frequency counter connected to TP3 & chassis placed nearest to TP3.	98 MHz	98 MHz	Adj 10 (VR301)	Frequency 19.05 kHz \pm 20 Hz
14	Sig. (Stereo signal) connected to antenna terminal through dummy antenna.	VTVM & oscilloscope connected to output.	98 MHz	98 MHz	Adj 10 (VR301)	Separation Maximum

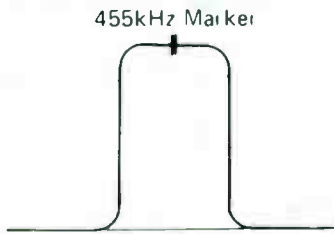


Fig. 10

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

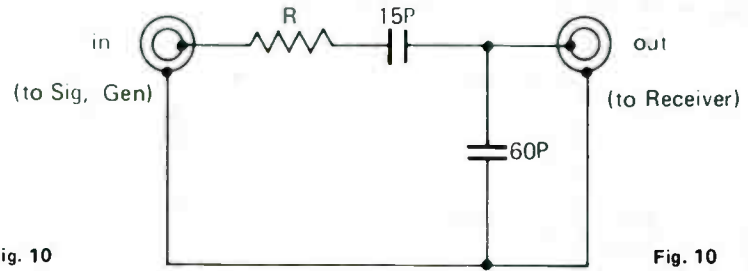
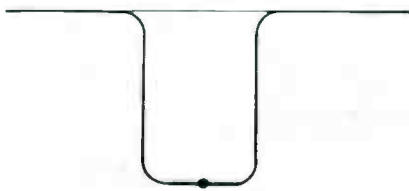


Fig. 10

Dummy Ant.

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



10.7MHz Marker

Fig. 11

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

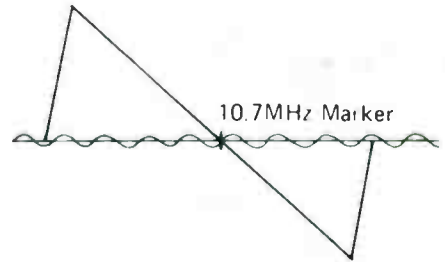


Fig. 12

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

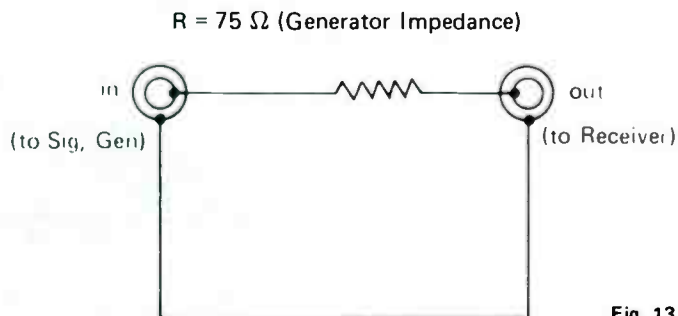


Fig. 13

A) Adjusted sections (Symbol: Adj.)
Adj. 1 – Adj. 10

B) Testing points (Symbol: TP)
TP1 – TP5

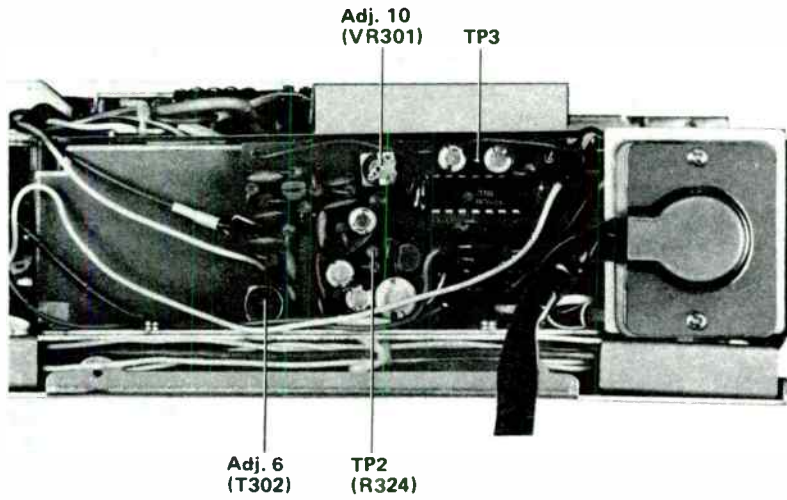


Fig. 14

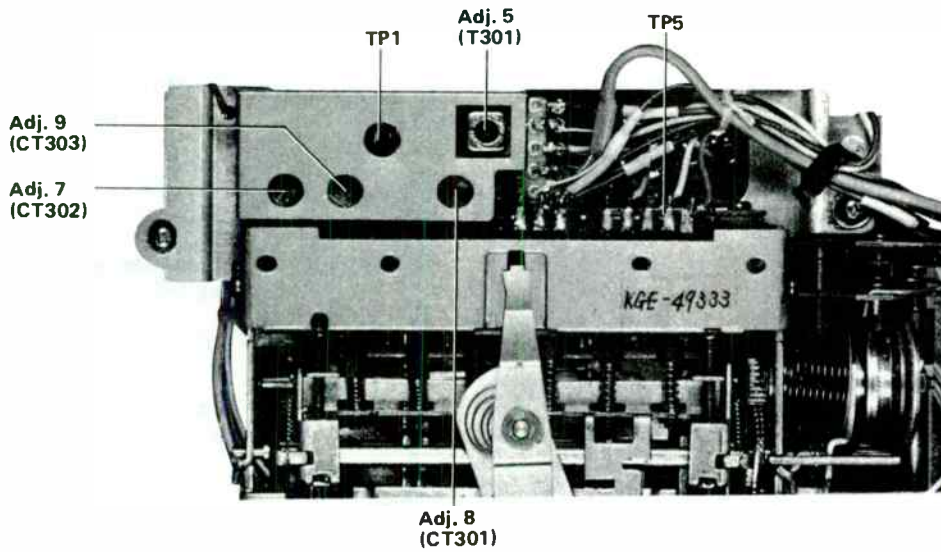


Fig. 15

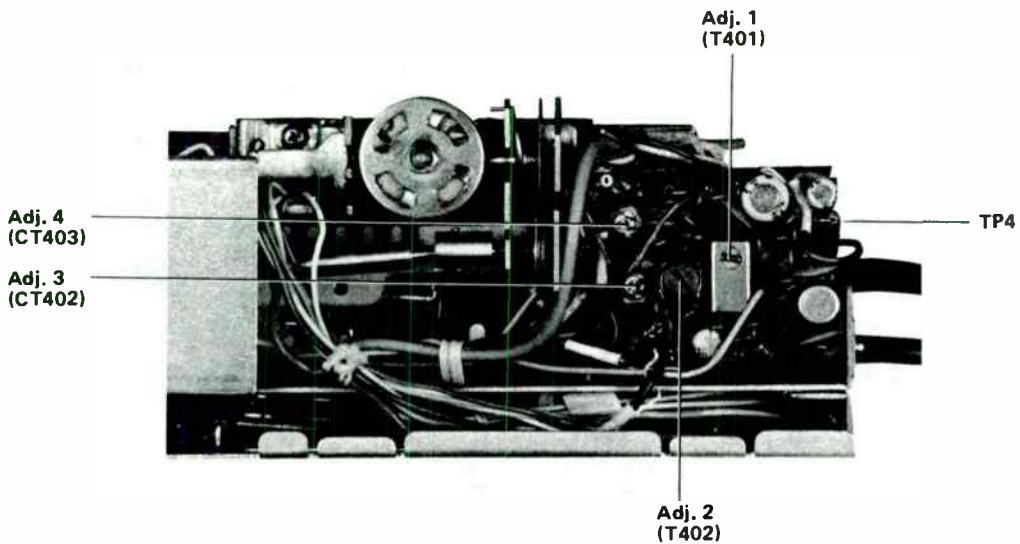
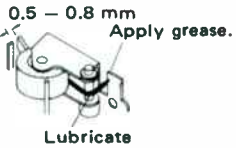

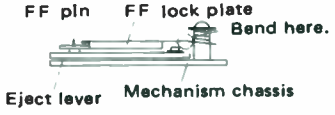



Fig. 16

7. TROUBLESHOOTING

7.1 Tape section

Symptom	Cause	Correction
<p>Tape doesn't rotate. Motor doesn't rotate.</p> <p>Motor rotates. (but tape does not rotate.)</p>	<ol style="list-style-type: none"> 1. Switch S3 2. Power fuse 1. Slippage of a soiled belt (19) (20), and pinch roller (21). 2. Belt (19) (20) disengaged. 3. Motor pulley unsoldered. 4. Lack of pinch roller pressure due to defect in pinch roller arm. 5. Lack of pinch roller pressure due to poorly positioned head plate (2). 6. Cassette tape defective. 	<p>Replace. Replace.</p> <p>Clean.</p> <p>Reengage. Resolder.</p>  <p>0.5 - 0.8 mm Apply grease. Lubricate</p> <ul style="list-style-type: none"> • Adjust sag of head leads. • Wire amp leads freely from head plate (2). <p>Replace.</p>
<p>Tape speed is too fast.</p>	<ol style="list-style-type: none"> 1. Defect of pinch roller arm. 2. Lack of pinch roller pressure due to poorly positioned head plate (2). 3. Motor defective. <p>*Use screw bond "Super 5M".</p>	<p>Same as 4 in "Motor rotates". Same as 5 in "Motor rotates".</p> <ul style="list-style-type: none"> • Replace. • Motor pulley change. <ol style="list-style-type: none"> i) Unsolder motor pulley. ii) Unsolder adjusting pulley*.  <p>4.7 ± 0.6 mm</p>
<p>Fast forward is impossible.</p>	<ol style="list-style-type: none"> 1. FF plate can not be locked. 2. Slippage of soiled flywheel (16) and reel disc. 3. Lack of reel disc (22) friction torque. 4. Motor defective. 5. Cassette tape defective. 	<ul style="list-style-type: none"> • FF lock plate is not horizontal.  <p>FF pin FF lock plate Bend here. Eject lever Mechanism chassis</p> <ul style="list-style-type: none"> • Bend FF lock plate downward as indicated.  <p>Clean.</p> <p>Replace.</p> <p>Replace. Replace.</p>

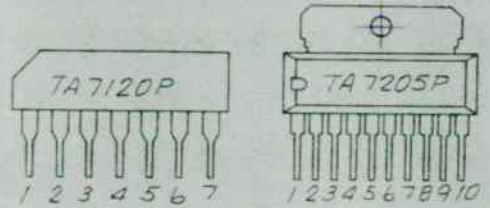
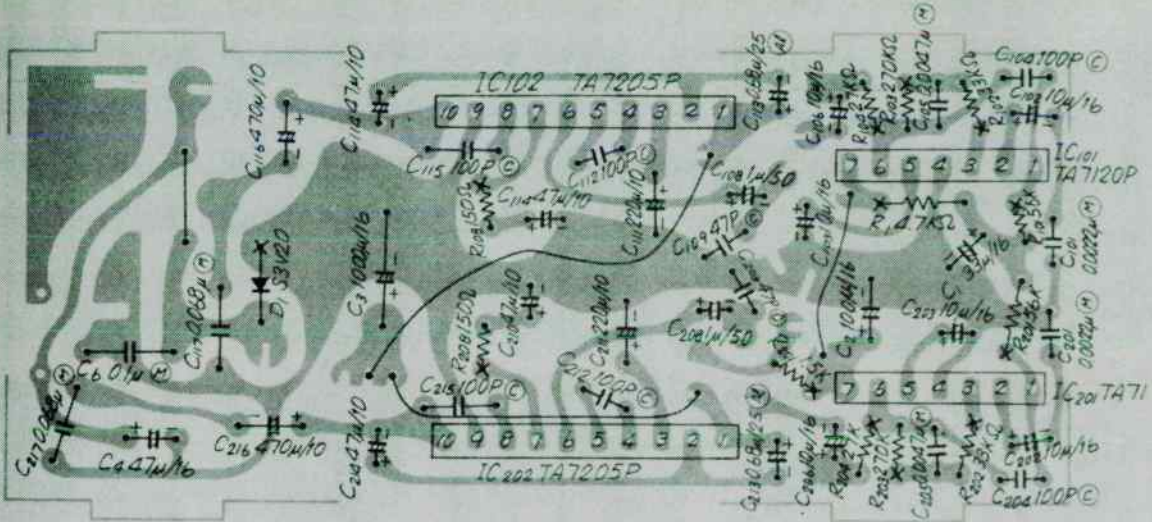
Symptom	Cause	Correction
Excessive wow and flutter.	<ol style="list-style-type: none"> Slippage of belt, flywheel, capstan. Expansion of belt (19), (20). Excessive or lack of take-up torque. Lack of pinch roller pressure. Defect of flywheel (16). Motor defective. Cassette tape defective. 	Clean. Replace. Replace reel disc (22). See 4 in "Motor rotates". Replace. Replace. Replace.
Mechanical noise.	<ol style="list-style-type: none"> Pinch roller and capstan bearing wanting lubrication. Motor defective. Reel disc defective. 	Lubricate. Replace. Replace.
Auto stop mechanism inoperable.	Cassette sensor position defective.	Adjust so that the sensor is in complete contact with the tape face.
Head plate return defective.	<ol style="list-style-type: none"> Eject lever bend defective. Head plate bend defective. Head roller does not turn. 	Replace. Replace. • Replace. • Lubricate head roller.
Cassette can't be loaded normally.	<ol style="list-style-type: none"> Cassette holder plate spring (3) poorly positioned. Cassette sensor excessively enters into the cassette holder. Cassette tape defective. 	Adjust at the place indicated by the arrow. Adjust cassette sensor. Replace.
Cassette can't be ejected normally.	<ol style="list-style-type: none"> Door (84) deformed. Cassette holder plate spring (3) poorly positioned. Cassette tape defective. 	Repair. Same as 1 in "Cassette can't be loaded normally". Replace.
Tape lamp does not light.	<ol style="list-style-type: none"> Lead wires to lamp are broken. Auto stop switch defective. Warning P.C.B. defective. 	Check. Adjust or replace. Check.
Tape lamp does not light at tape end.	<ol style="list-style-type: none"> Auto stop switch defective. Warning P.C.B. defective. 	Check. Check.

7.2 Amplifier section

Symptom	Cause	Correction
Lack of sound volume and/or distortion of sound.	<ol style="list-style-type: none"> Head is soiled or damaged. Head position is improper. R107 (207) or 105 (205) is defective. Preamp. or power amp. is defective. 	Clean or replace. Adjust. Replace. Check or replace.
High notes are lost.	<ol style="list-style-type: none"> Head is dirty or damaged. Head position is improper. R106 (206) or C107 (207) is defective. 	Clean or replace. Adjust. Check and replace.

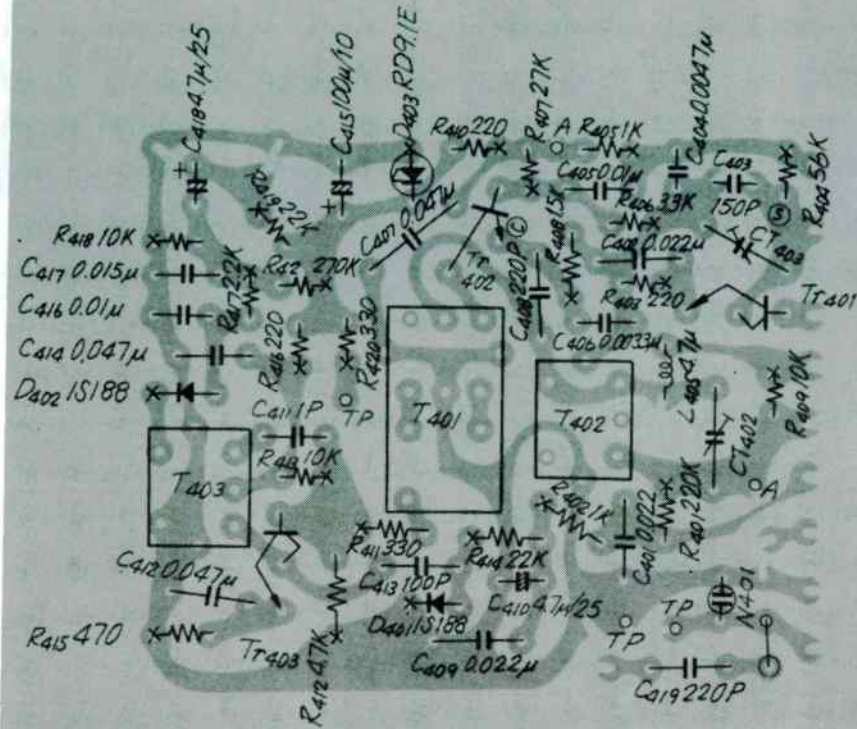
7.3 Radio section

System	Cause	Correction
<p>No sound</p> <ul style="list-style-type: none"> Tape works normally. Dial scale lamp lights. Output at A and B are normal with input from antenna jack. 	<ul style="list-style-type: none"> 1. Switch S1 1. Switch S302 1. Switch S302, S303. Lead ①, ② disconnected. 	<ul style="list-style-type: none"> Check or replace. Check or replace. Check or replace.
<p>FM doesn't sound.</p> <p>FM sensitivity is low.</p> <ul style="list-style-type: none"> Q40 base voltage is 9.0 V (Tr305). Q40 emitter voltage is 8.4 V (Tr305). With 98 MHz modulated by 400 Hz at 30 % applied from antenna 3 dB limiting sensitivity is about 20 dBμ at (TP2). With the same input, 3 dB limiting sensitivity is about 20 dBμ at 4 ohm load of audio output. 	<ul style="list-style-type: none"> 1. D302, Tr305 1. Tr305, IC301, IC302, Tr304 1. Tr304, F301, F302, T302, SW301, R301 1. IC302, D304, 305, 306, 307 	<ul style="list-style-type: none"> Check or replace. Check or replace. Replace. Adjust. Check or replace.
<p>Channels are not separated with FM stereo.</p> <p>FM MPX lamp doesn't light.</p> <ul style="list-style-type: none"> With frequency counter connected at (TP3) oscillation frequency is 19.05 kHz \pm 20 Hz. With 98 MHz modulated by 19 kHz at 10 % applied and when 20 dBμ input is applied to the above-mentioned signal, the MPX lamp does not light. 	<ul style="list-style-type: none"> 1. VR301 2. IC302 1. T302, IC302 2. Lead wire to stereo lamp is broken. 	<ul style="list-style-type: none"> Adjust. Check or replace. Check or replace. Replace.
<p>MW doesn't produce sound.</p> <p>MW sensitivity is low.</p> <ul style="list-style-type: none"> Voltage at Tr401 base is 0.7 V. When 455 kHz modulated by 400 Hz at 30 % applied through 0.01 μF to (M1) from SG, output is normal at (TP4). With same input, output A, B are normal. Output and frequency of local oscillation are normal across lead (flexible lead). With 1000 kHz modulated by 400 Hz at 30 % applied from antenna socket, output is normal. 	<ul style="list-style-type: none"> 1. Tr401, D403 1. Tr402, Tr403, T401 1. D304, 305, 306, 307 1. Lead (flexible lead ③, ④) disconnected. 2. T402, L402 1. Lead ⑤, ⑥, ⑦, ⑧ and/or (flexible lead) disconnected. 2. SW301 	<ul style="list-style-type: none"> Check or replace. Check & replace. Check & replace. Connect. Check & replace. Connect. Check or replace.



IC PIN NO.

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

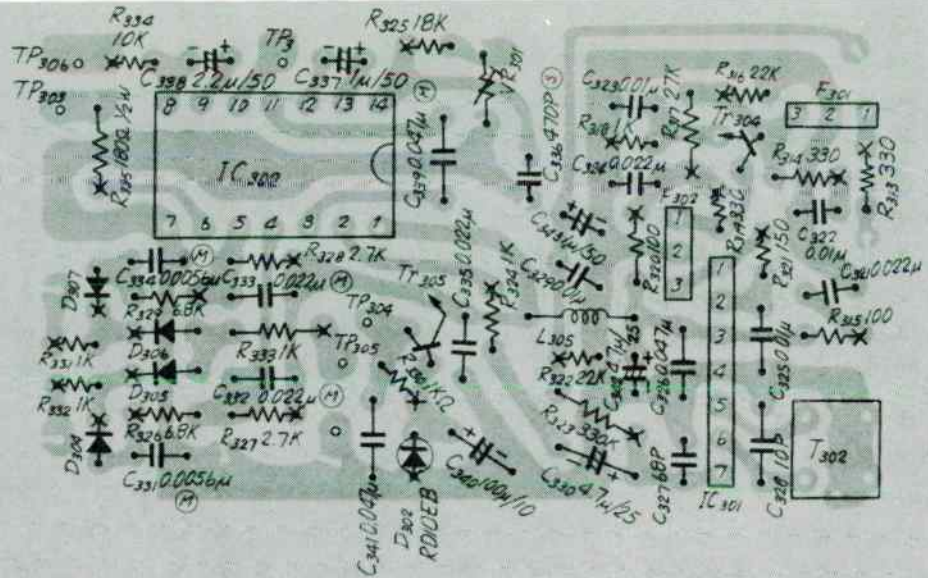


Tr401, 403 : 2SC1675K

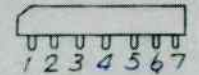
Tr402: 2SC1675L

Note:

1. A~A is a jumper wire (brown)
2. R418 should be mounted by bending the SR resistor.
3. Leads should be soldered cut to less than 2mm after being soldered.
4. Test points should extend between 4~8mm.
5. Parts should be mounted less than 2mm above the board.
6. C418 should be soldered onto the P.C. board.

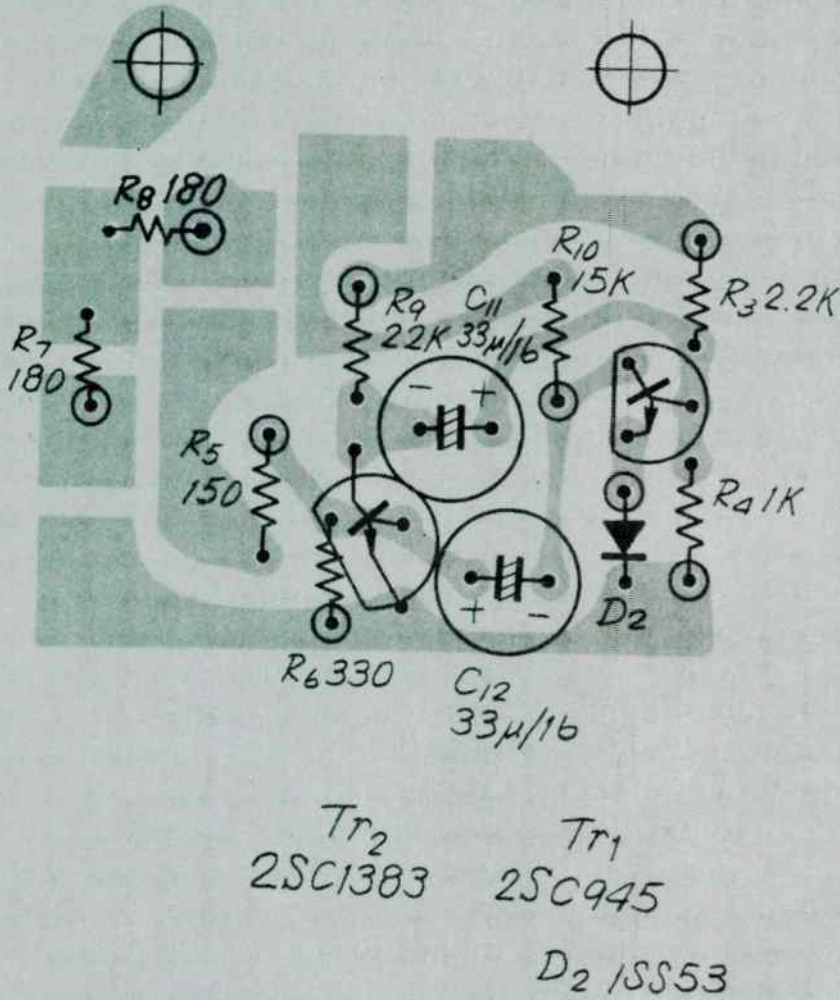


1. Leads should be soldered cut to less than 2mm after being soldered.
2. VR₁₀₁ should be mounted by bending.
3. F₃₀₁, F₃₀₂ should be of the same grade.
4. The pin numbers of IC₃₀₁ are as in the following figure below.



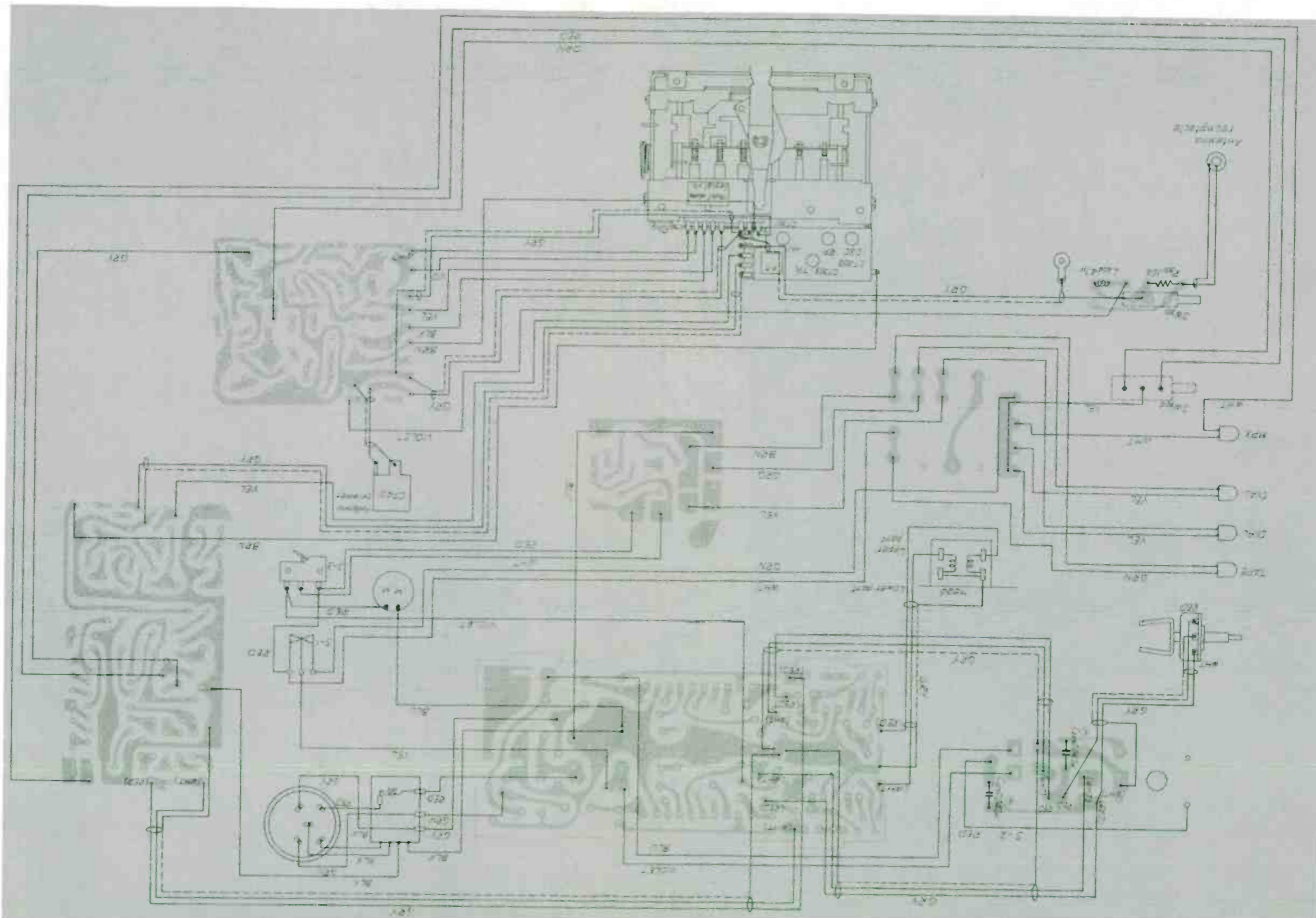
5. Test point should be extend between 4 and 8mm.
6. Parts should be mounted less than 2mm above the board.

Auto-stop warning circuit board mounting diagram



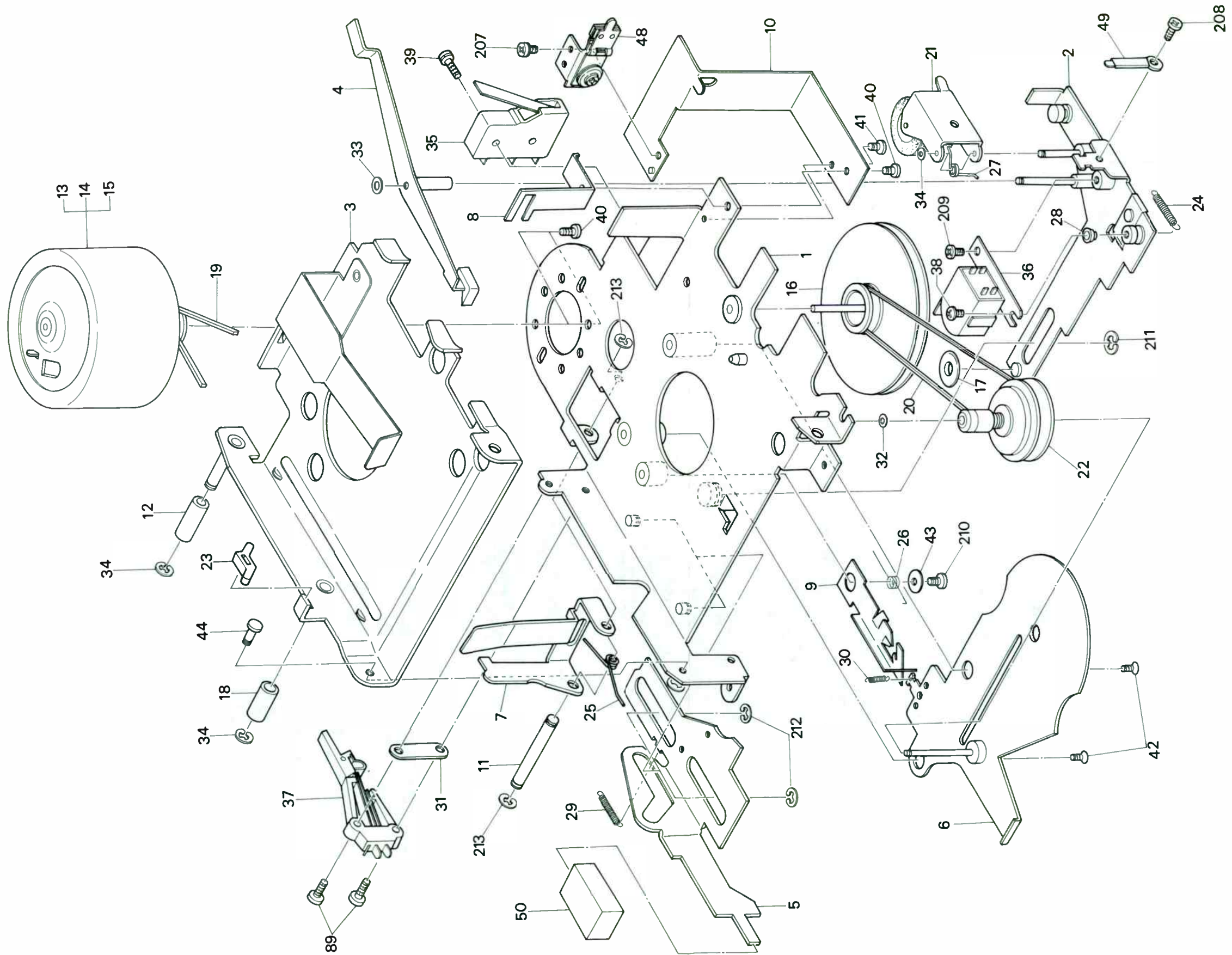
Note:

⊙ indicates the resistor itself.



9. EXPLODED VIEWS

Sankyo SCS-444



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

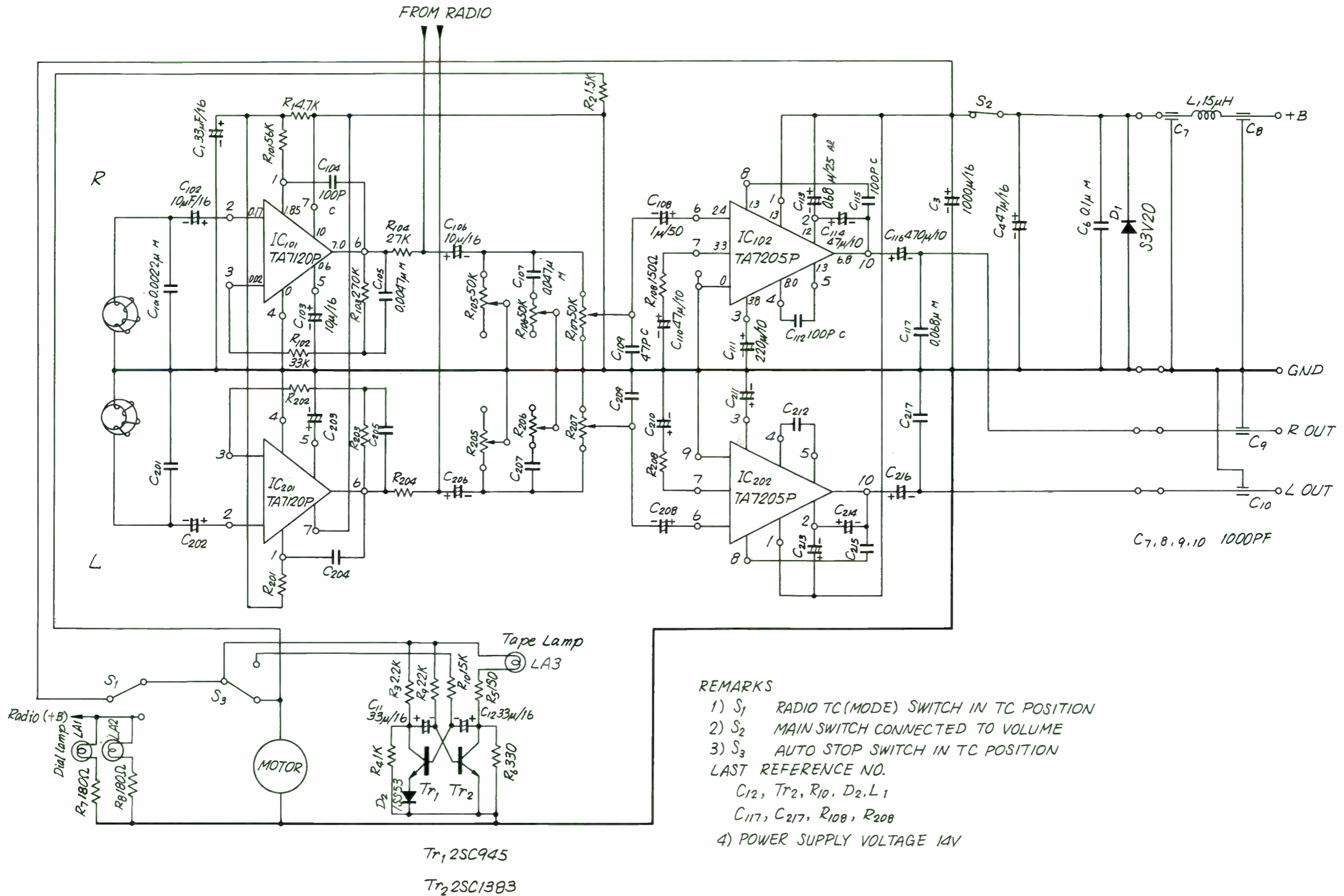
10. MECHANICAL PARTS LIST

Drawing No.	Part No.	Part Name	Q'ty	Remarks	Original model
49	KGE 0356	Wire clamp	2		SCS-222
109	KGE 0357	"	1		"
60	KGE 011399	Mounting plate ass'y A	1		"
69	KGE 011402	Mounting plate ass'y C	1		"
61	KGE 011564	Filter case ass'y	1		"
83	KGE 011731	Mechanical unit	1		"
65	KGE 011872	5P socket ass'y	1		"
71	KGE 011906	Mounting plate ass'y B	1		"
88	KGD 012010	Nose piece ass'y	1		"
67	KGE 012012	FM/IF base ass'y	1		"
70	KGE 012013	MW base ass'y	1		"
53	KGD 012122	Upper case ass'y	1		"
57	KGE 012203	AU amp. ass'y	1		"
77	KGE 012204	Auto stop base ass'y	1		"
76	KGE 012319	Joint ass'y	1		"
1	307-003H	Mech. chassis ass'y	1		SCS-222
2	307-010	Head chassis ass'y	1		"
4	307-020	Auto stop ass'y	1		"
7	307-026M	Lock plate M	1		"
8	307-028	Stopper plate	1		"
9	307-030B	Stopper plate F.F.	1		"
10	307-031W	Locker stud W	1		"
18	307-033W	Roller	1	φ 4.3	"
13	307-034A	Motor pulley ass'y A	0~1	φ 11 (Standard)	"
14	307-034B	Motor pulley ass'y B	0~1	φ 10.95 (Adjusting)	"
15	307-034C	Motor pulley ass'y C	0~1	φ 11.05 (Adjusting)	"
16	307-035	Flywheel	1		"
21	307-038	Pinch roller ass'y	1		"
22	307-039	Reel clutch ass'y	1		"
24	307-042W	Head chassis spring	1		"
25	307-044	Lock spring	1		"
26	307-045	F.F. lock spring	1		"
27	307-046	Pinch roller spring	1		"
28	307-047	Azimuth spring	1		"
30	307-055	Case spring	1		"
23	307-071	Plastic holder	1		"
32	307-100	Teflon washer	1	φ 1.2	"
33	307-101	"	1	φ 1.7	"
34	307-102	"	1	φ 2	"
35	307-105	Micro switch	1		"
36	307-106	Cassette head	1		"
37	307-108	Power switch	1		"
6	307-109B	Flywheel support ass'y	1		"
29	307-125	Eject spring B	1		"
5	307-126	Eject lever ass'y	1		"
10	307-136	Antenna plate	1		"
17	307-144	Head roller	1	φ 10	"
3	307-147	Cassette chassis ass'y	1		"
19	307-148	Drive belt	1		"
20	307-148B	Clutch belt	1		"
31	307-153	Switch plate	1		"
44	307-192	Left pin	1		"
12	307-194	Roller S	1		"
38	307-301	Mushroom head screw	1	M2 x 8	"
39	307-302	⊕ P.H.N.S. with spring washer	3	M2 x 8	"
40	307-303	Bind screw	3	M2.6 x 3.5	"
41	307-304	"	1	M2.6 x 5	"
42	307-305	Flat screw	2	M2.6 x 5	"
43	307-306	Washer	1	φ 3	"

Drawing No.	Part No.	Part Name	Q'ty	Remarks	Original model
98	KGE 1905	Cushion	1/2		
52	KGE 13841	F.C.C. label	1		SCS-222
84	KGE 20608	Tri-shaft volume	1		"
79	KGE 20630	Tuning shaft with V.R.	1		"
48	KGE 30092	Trimmer condenser	1		"
100	KGE 42488	Push switch	2		"
66	KGE 49299	Antenna holder	1		"
54	KGE 49333	5P tuner	1		"
91	KGE 49341	Lamp (For dial)	1		"
90	KGE 49342	" (")	1		"
92	KGE 49343	Lamp (For M.P.X.)	1		"
89	KGE 49344	" (For Tape)	1		"
82	KGE 50737	Cover plate	1		SCS-222
58	KGE 98168	Heat sink	1		"
95	KGE 98182	Cassette door shaft	1		"
102	KGE 98194	Push button	2		"
63	KGE 98197	Filter cover	1		SCS-222
64	KGE 98198	Filter clamper	1		"
85	KGE 98259	Volume base plate	1		"
68	KGE 98572	Separator	1		"
62	KGE 98662	Shield plate	1		"
56	KGE 98867	"	1		"
111	KGE 98977	Nut	4		"
110	KGE 98978	Washer	6		"
86	KGE 99028	Volume holder	2		"
108	KGC 99067	Front panel A	1		"
109	KGD 99068	Front panel B	1		"
107	KGD 99071	Gasket	1	Option	"
113	KGD 99069	Inner knob	2		"
112	KGD 99070	Outer ring	2		"
51	KGE 99129	Model name plate	1		"
104	KGC 99136	Bottom case	1		SCS-222
106	KGD 99139	Bottom plate	1		"
81	KGE 99141	Side bracket	2		"
55	KGE 99142	Auto stop base mounting plate	1		"
50	KGE 99150	Eject button	1		"
94	KGC 99245	Front chassis	1		"
59	KGD 99248	Tuner holder	1		"
75	KGD 99249	Mounting plate supporter	1		"
80	KGE 99252	Side bracket supporter	2		"
74	KGE 99253	Column	2		"
73	KGE 99254	Mounting plate	1		"
55	KGE 99256	Indicator	1		"
96	KGE 99266	Front frame (right)	1		"
87	KGE 99267	" (left)	1		"
99	KGE 99268	Switch mounting plate	1		"
93	KGE 99289	Lamp holder	2		"
103	KGE 99298	Collar	2		"
72	KGE 99318	Terminal P.C. board	1		"
101	KGE 99319	Switch P.C. board	1		"
105	KGE 99395	Cover plate	2		"
97	KGE 99433	Door stopper	1		"
205	14255	⊕ P.H.M.S.	3	M2.6 x 4	"
209	14380	"	1	M2 x 6	"
208	14536	"	1	M2.6 x 3	"
210	14572	"	2	M3 x 4	"
206	19012	⊕ P.H.N.S. with spring washer	4	M2.6 x 8	"

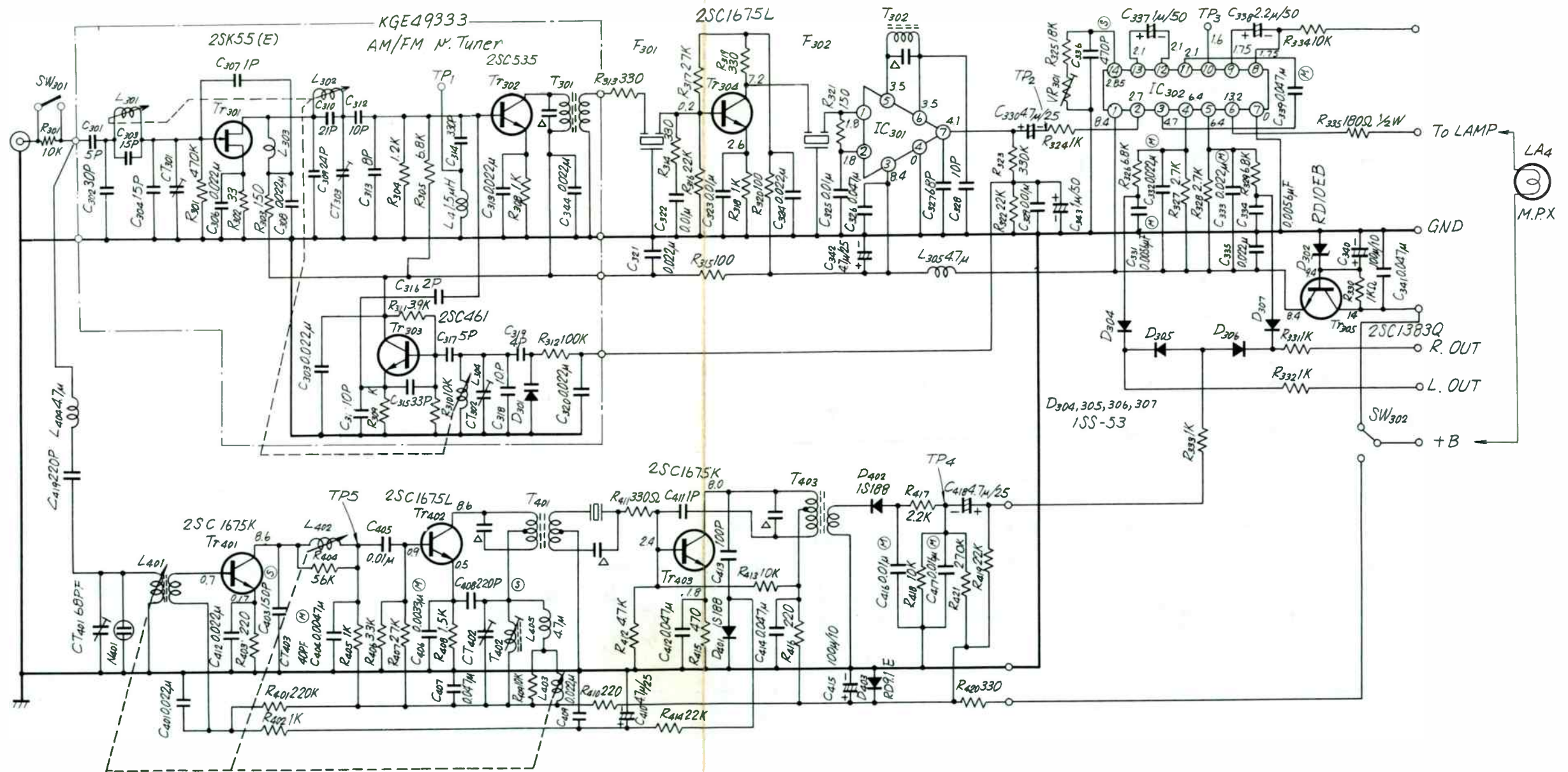
8. DRAWINGS AND ELECTRICAL PARTS LIST

8.1 Amplifier circuit diagram



Sankyo SCS-444

8.2 Tuner circuit diagram



REMARKS

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

8.3 Electrical parts list

Amplifier section

Ref. No.	Part No.	Description	Remarks	Q'ty	Original model
IC101, 201	KGE 46441	IC	TA7120P	2	SCS-222
IC102, 202	KGE 46259	"	TA7205P	2	"
Tr1	KGE 46147	Transistor	2SC945 (K)	1	"
Tr2	KGE 41414	"	2SC1383	1	"
D1	KGE 46435	Diode	S3V20	1	"
D2	KGE 46465	"	1SS-53	1	"
L1	KGE 47053	Inductor	15 mH	1	"
LA1	KGE 49341	Lamp (right)	Drawing No. 91	1	
LA2	KGE 49342	" (left)	Drawing No. 90	1	
LA3	KGE 49344	" (TAPE)	Drawing No. 89	1	
LA4	KGE 49343	" (MPX)	Drawing No. 92	1	
S1	307-108	Power switch	Drawing No. 37	1	SCS-222
S2			Included in KGE 20608		
S3	307-105	Micro switch		1	"
C1, 11, 12	KGE 34771	Electrolytic	33 μ F/16	3	
C2	KGE 34773	"	100 μ F/16	1	
C3	KGE 34777	"	1000 μ F/16	1	
C4	KGE 34772	"	47 μ F/16	1	
C6	KGE 31148	Mylar	0.1 μ F/50	1	
C7, 8, 9, 10	KGE 35474	Feed-thru cap.	1000 pF/50	4	
C101, 201	KGE 10125	Mylar	0.0022 μ F/50	2	
C102, 103, 106, 202, 203, 206	KGE 34769	Electrolytic	10 μ F/16	6	
C104, 112, 115, 204, 212, 215	KGE 33401	Ceramic	100 pF/50	6	
C105, 205	KGE 10559	Mylar	0.0047 μ F/50	2	
C107, 207	KGE 10577	"	0.047 μ F/50	2	
C108, 208	KGE 34800	Electrolytic	1 μ F/50	2	
C109, 209	KGE 33393	Ceramic	47 pF/50	2	
C110, 114, 210, 214	KGE 34762	Electrolytic	47 μ F/10	4	
C111, 211	KGE 34764	"	220 μ F/10	2	
C113, 213	KGE 33722	Aluminium fixed	0.68 μ F/25	2	
C116, 216	KGE 34813	Electrolytic	470 μ F/10	2	
C117, 217	KGE 3243	Mylar	0.068 μ F/50	2	
R1	KGE 10146	Carbon	4.7 k Ω RD1/4UR	1	
R2	KGE 11260	"	1.5 k Ω "	1	
R3	KGE 5066	"	2.2 k Ω "	1	
R4	KGE 11258	"	1 k Ω "	1	
R5	KGE 26176	"	150 Ω RD1/2SR	1	
R6	KGE 3226	"	330 Ω RD1/4UR	1	
R7, 8	KGE 26178	"	180 Ω RD1/2SR	1	
R9	KGE 5068	"	22 k Ω RD1/4UR	1	
R10	KGE 2532	"	15 k Ω "	1	
R101, 201	KGE 10149	"	56 k Ω "	2	
R102, 202	KGE 6265	"	33 k Ω "	2	
R103, 203	KGE 21131	"	270 k Ω "	2	
R104, 204	KGE 5067	"	27 k Ω "	2	
R105, 205	KGE 20640	Variable resistor	50 k Ω	1	
R106, 107, 206 207	KGE 20608	"	"	1	
R108, 208	KGE 10141	Carbon	150 Ω RD1/4UR	2	

Tuner section

Ref. No.	Part No.	Description	Remarks	Q'ty	Original model
IC301	KGE 46442	IC	TA7130P	1	
IC302	KGE 46278	"	SN76115N	1	
Tr304	KGE 46338	Transistor	2SC1675L	1	STR-245FS
Tr305	KGE 41414	"	2SC1383Q	1	SCS-222
Tr401, 403	KGE 46339	"	2SC1675K	2	STR-245FS
Tr402	KGE 46338	"	2SC1675L	1	"
D301		Diode	Included in KGE 49333		
D302	KGE 46297	"	RD10EB	1	SCS-222
D304, 305, 306, 307	KGE 46465	"	1SS-53	4	"
D401, 402	KGE 41959	"	1S188FM-1	2	STR-245FS
D403	KGE 46296	"	RD9.1EB	1	SCS-222
N401	KGE 49220	Neon lamp	NE-38	1	"
T301		Transistor	Included in KGE 49333		
T302	KGE 47080	FM, I.F.T.	119ACS-13107Z	1	SCS-222
T401	KGE 40677	MW, ceramic filter	CFZ-455C	1	"
T402	KGE 40951	MW, oscillator transformer	7BR-3104N	1	"
T403	KGE 47040	MW, I.F.T.	159GC-1009	1	"
L301~304			Included in KGE 49333		
L401~403			"		
L305, 404, 405	KGE 40080	Micro inductor	4.7 μ H	3	SCS-222
CT401	KGE 30092	Trimmer	68 pF	1	"
CT402, 403	KGE 30098	"	40 pF	2	"
F301, 302	KGE 47032	FM ceramic filter	SFE10.7MA5Z (A, B)	2	SCS-222
VR301	KGE 20191	Semi variable resistor	6.8 k Ω (B)	1	"
C301~320			Included in KGE 49273		
C321, 324, 335	KGE 33564	Ceramic	0.022 μ F/50	3	
C322, 323, 325, 329	KGE 33563	"	0.01 μ F/50	4	
C326, 341	KGE 33565	"	0.047 μ F/50	2	
C327	KGE 33462	"	68 pF/50	1	
C328	KGE 33442	"	10 pF/50	1	
C330, 342	KGE 34779	Electrolytic	4.7 μ F/25	2	
C331, 334	KGE 31118	Mylar	0.0056 μ F/50	2	
C332, 333	KGE 3224	"	0.022 μ F/50	2	
C336	KGE 34641	Polystyrene	470 pF/50	1	
C337, 343	KGE 34800	Electrolytic	1 μ F/50	2	
C338	KGE 34801	Electrolytic	2.2 μ F/50	1	
C339	KGE 10577	Mylar	0.047 μ F/50	1	
C340	KGE 34763	Electrolytic	100 μ F/10	1	
C401, 402, 409	KGE 33564	Ceramic	0.022 μ F/50	3	
C403	KGE 34629	Polystyrene	150 pF/50	1	
C404	KGE 10559	Mylar	0.0047 μ F/50	1	
C405	KGE 33563	Ceramic	0.01 μ F/50	1	
C406	KGE 5071	Mylar	0.0033 μ F/50	1	
C407, 412, 414	KGE 33565	Ceramic	0.047 μ F/50	3	
C408	KGE 35750	"	220 pF/50	1	
C410, 418	KGE 34779	Electrolytic	4.7 μ F/25	2	
C411	KGE 33367	Ceramic	1 pF \pm 0.25 pF	1	
C413	KGE 33401	"	100 pF \pm 5 %	1	
C415	KGE 34763	Electrolytic	100 μ F/10	1	
C416	KGE 1181	Mylar	0.01 μ F/50	1	
C417	KGE 3223	Mylar	0.015 μ F/50	1	
C419	KGE 33409	Ceramic	220 pF \pm 5 %	1	

TUNER ADJUSTMENT

The followings are radio alignment procedures for technicians reference.
 Note: Use a screwdriver with plastic grip for all adjustments.

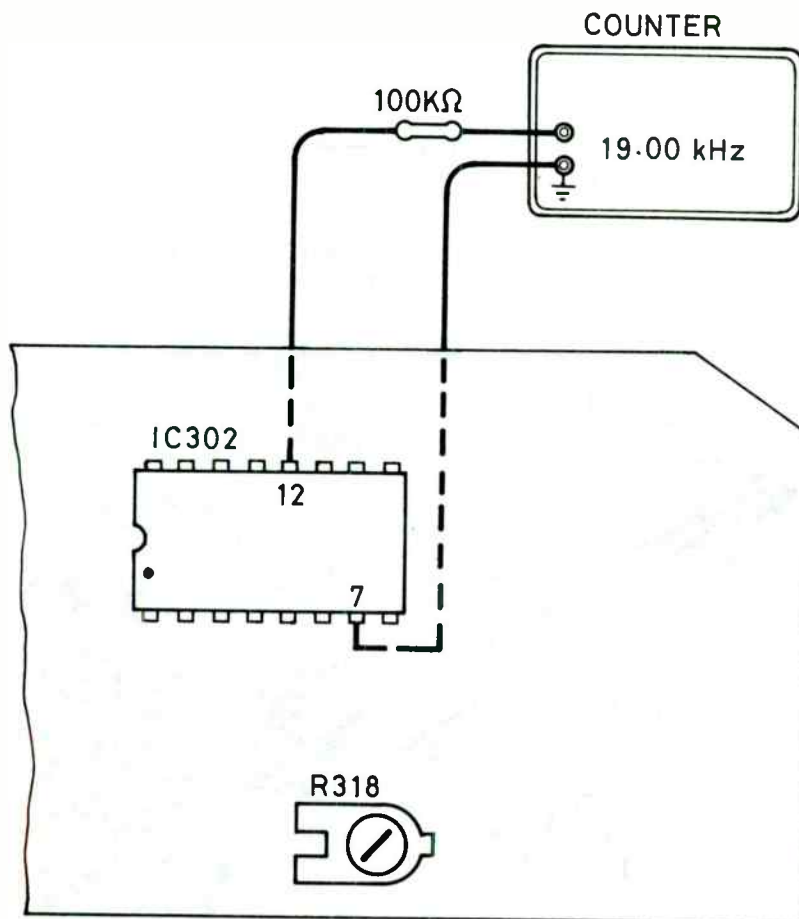
FM MPX ALIGNMENT

Adjusting circuit	Connections		Frequency	Position of tuning dial	Adjustment	Counter
	Input	Output				
MPX		IC302 No.12 Ground		No signals	R330 (SVR)	19.0kHz



AM ALIGNMENT

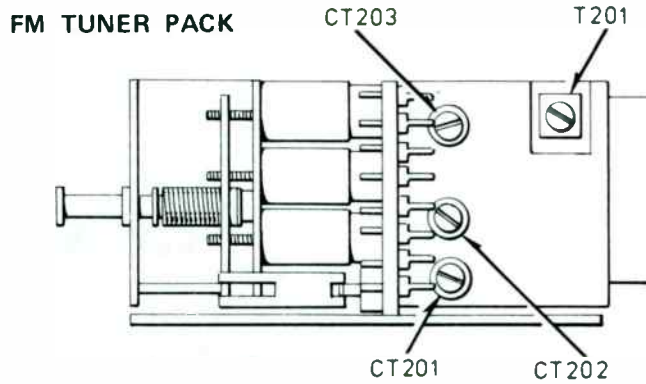
Note: Before alignment, obtain a 230 μ A collector current on Q101 with the R318 (SVR) at no signals condition.

Step	Adjusting circuit	Connections		SG frequency	Position of tuning dial	Adjustment	VTVM
		Input	Output				
1	IF	Connect AM IF SWE-EP to ANT Terminals.	Connect VTVM to Speaker Terminals	262.5kHz	Minimum	T303, T304 T307, T308	Maximum reading on VTVM
2	Covering	Connect AM SG to ANT Terminals.	Connect VTVM to Speaker Terminals.	1,680kHz	Maximum	CT-103 OSC (L103)	Maximum reading on VTVM
3				525kHz	Minimum		
Repeat steps 2 at 1,680kHz and 525kHz alternately.							
4	Tracking	Connect AM SG to ANT Terminals.	Connect VTVM to Speaker Terminals.	1,400kHz	1,400kHz	CT-101 CT-102	Maximum reading on VTVM



FM IF & RF ALIGNMENT

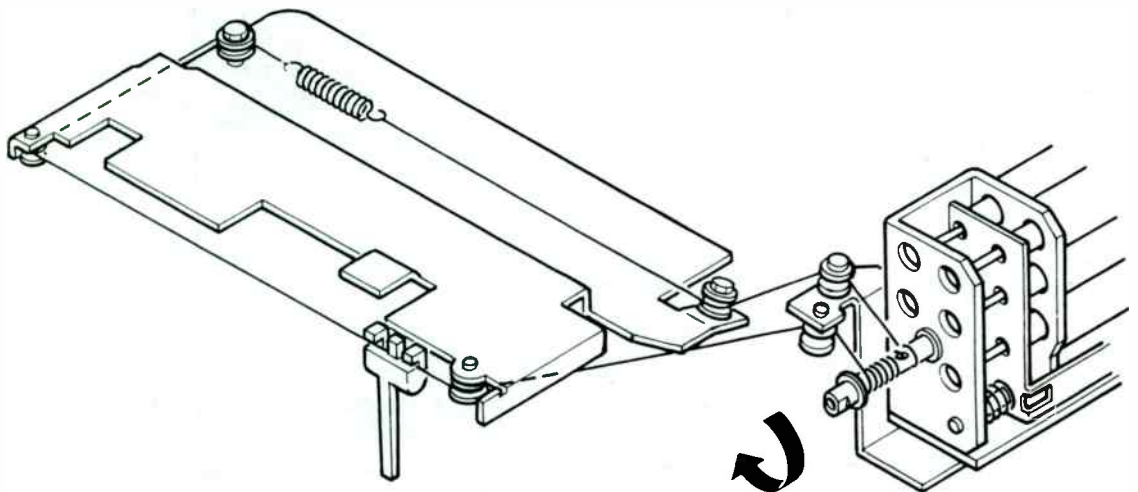
Step	Adjusting circuit	Connections		Frequency	Position of tuning dial	Adjustment	VTVM and Scope
		Input	Output				
1	IF	Connect sweep marker generator output to FM ANT terminal, Tuner Pack Case	Connect SMG input to test points R309. Chassis Ground.	10.7MHz (unmodulated)	Near maximum under no signal	T201 T301	
2	Detector		Connect SMG Input to test points R314. Chassis Ground.			T302	
3	Tuning Coverage and Dial Calibrator	Connect FM SG to FM ANT Terminals.	Connect VTVM to Speaker Terminals.	87MHz (400Hz 30% modulation)	Low End	CT203 (Tuner Pack)	Maximum reading on VTVM
4	Tracking			106MHz (400Hz 30% modulation)	106MHz	CT201,202 (Tuner Pack)	



Note:

This tuner pack has been precision aligned at the factory and it seldom requires further adjustment. Use special care not to temper with it.

DIAL CORD STRINGING



Key No.	Part No.	Description	Q'ty
CABINET & CHASSIS			
27	141-2-851T-95200	Spring Coil, Band Select	1
28	141-2-374T-10200	Bracket, Pilot Lamp, (left)	1
29	123-2-472R-00601	Lug, Lead mtg.	1
41	147-2-464T-01300	Fixer, Antenna Lead mtg.	1
46		Fiber Sheet, 10x10x0.3mm	1
47	141-2-351T-36000	Bracket, Mounting	1
48	141-2-363T-05100	Bracket, Capacitor	1

Key No.	Schematic Location	Part No.	Description	Q'ty
MOUNTING PARTS				
Y01			Screw, Pan Hd., 2x8mm	1
Y02			Screw, Pan Hd., 2.6x4mm	2
Y03			Screw, Pan Hd., 3x4mm	4
Y04			Screw, Pan Hd., 3x5mm	2
Y05			Screw, Flat Hd., 2x4mm	1
Y06			Screw, Bind Hd., 2.6x6mm	2
Y07			Screw, Pan Hd., with Spring Washer 3x5mm	2
Y08			Screw, Pan Hd., 3x8mm	4
Y09			Tapping Screw, Pan Hd., 2.3x4mm	1
Y10			Tapping Screw, Pan Hd., 2.6x12mm	1
Y11			Tapping Screw, Pan Hd., 3x6mm	18
Y12			Screw, Headless, 2.6x8mm	1
Y13			Nut, 3mm	2
Y14			Washer, 3x6x0.5mm	2
Y15			Washer, 3x8x0.5mm	2
Y16			External Tooth Lock Washer, 3mm	1
Y17			Screw, Pan Hd., 3x6mm	3
Y18			Washer, 2.3x4.3x0.3mm	1
Y19			Screw, Pan Hd., with Washer, 3x4mm	1
Y20			Nut, 2.6mm	1
Y21			Spring Washer, 3mm	2
Y22			Screw, Pan Hd., with Spring Washer, 3x8mm	1

SEMICONDUCTORS				
	IC301		Integrated Circuit, LA1201B2	1
	IC302		Integrated Circuit, LA3350B	1
	Q101,102		Transistor, 2SC9410	2
	Q301		Transistor, 2SC930	1
	Q701,751		Transistor, 2SC536AUD	2
	Q702,752		Transistor, 2SC536AUD	2
	Q703,753		Transistor, 2SC711	2
	Q704,754		Transistor, 2SA696	2
	Q705,755		Transistor, 2SC1162WT	2
	Q706,756		Transistor, 2SA715WT	2
	D301,302		Diode, 1S188AM	2
	D303,304		Diode, 1S188FM	2
	D305		Diode, WZ090	1
	D306,101		Diode, DS442	2
	D307		Diode, SLP24B	1
	D701,702,751,752		Diode, MA26A	4
37	D791		Diode, 1N4001	1

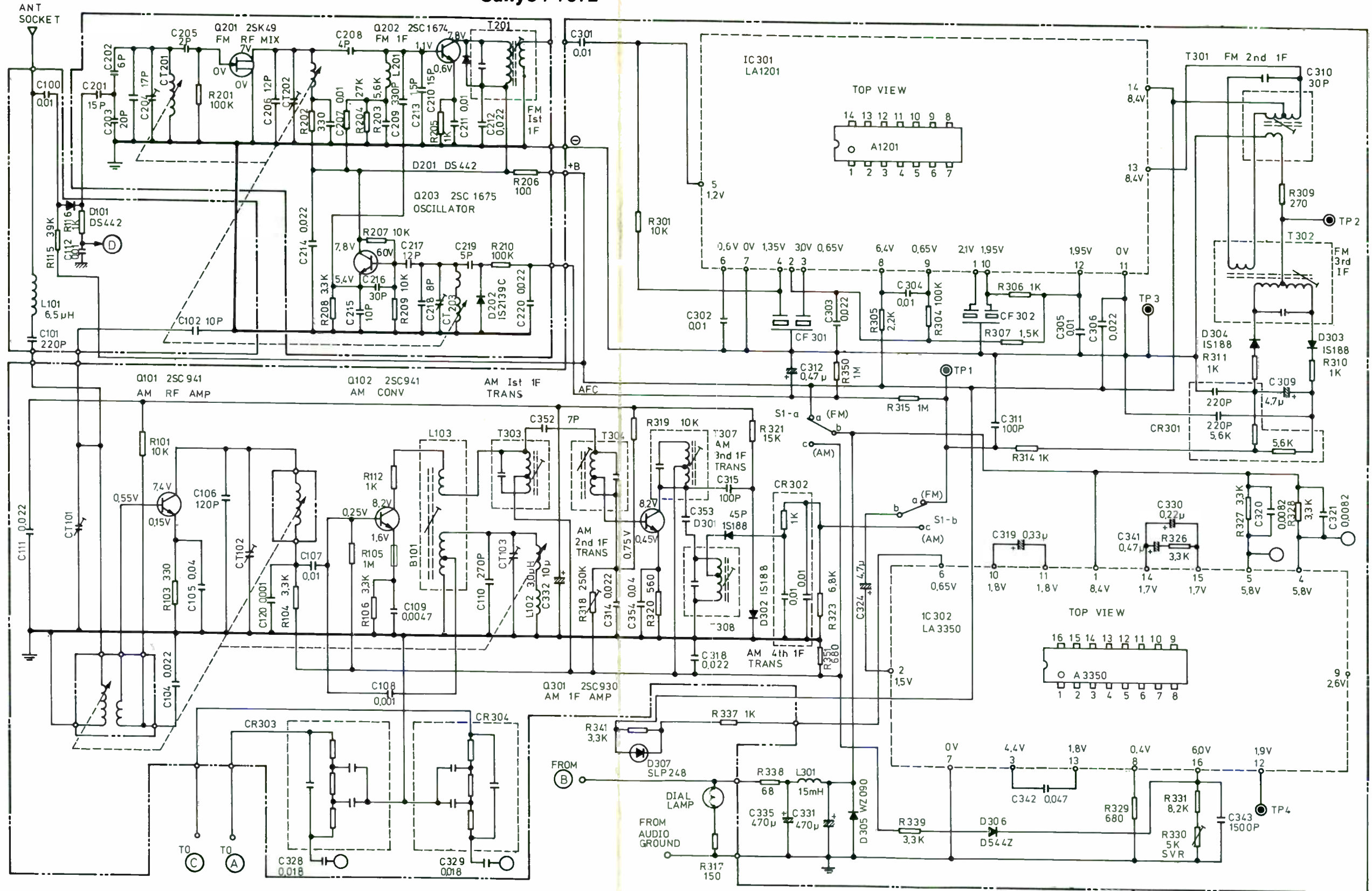
Key No.	Schematic Location	Part No.	Description	Q'ty
ELECTRICAL PARTS				
	L101	4-253T-05800	Choke Coil, 6.5μH	1
	L102	4-253T-08600	Choke Coil, 3μH	1
	L103	4-258T-10400	Oscillator Coil	1
		4-258T-10430		
	L301	4-253T-01015	Choke Coil, 15mH	1
	L701	4-252T-04430	Choke Coil	1
	T301	4-256R-15130	Transformer, FM 2nd IF	1
	T302	4-256R-02330	Transformer, FM 3rd IF	1
	T303,307	4-256T-06700, 4-256T-06730	Transformer, AM 1st IF, 3rd IF	2
		4-256T-06600, 4-256T-06630		
	T304	4-256T-06600, 4-256T-06630	Transformer, AM 2nd IF	1
	T308	4-256T-06800	Transformer, AM 4th IF	1
	CF301,302	4-256T-80400	Filter, 10.7MHz, Red/Blue/Orange (a pair)	2
	CR301	4-227R-11600	CR Pack	1
	CR302	4-227T-01500	CR Pack	1
	CR303,304	4-227T-01400, 4-227T-01410	CR Pack	2
	S1	4-231T-42173	Switch, Band Select	1
	S2	4-231T-15600	Switch, DX/LOCAL	1
	S4	4-231T-51300	Switch, R/T	1
	B101	123-2-471R-10400	Bead Core	1
		4-235T-32600	Socket, 6 Pin with Lead	1
		4-236T-09800	Plug, 6 Pin	1
		4-235T-33500	Socket, Antenna	1
	44	141-2-472T-01000	Lug, Antenna Earth	1
	45	141-2-472T-01001	Lug, Lead mtg.	1
	39	4-125T-01502	Tuner Pack	1
	36	4-612T-06400	Lamp, 5V 60mA	5
	38	4-235T-20200	Socket, 9 Pin	1
		4-234T-00100	Fuse, 3A	1
	32	4-226T-765930	P.C.B. Assembly, Audio	1
	34	4-226T-856911	P.C.B. Assembly, Power	1
	33	4-226T-855911	P.C.B. Assembly, R/T Switch	1
	42	4-226T-811914	P.C.B. Assembly, Tuner	1
	43	4-226T-854912	P.C.B. Assembly, Trimmer	1
	35	4-226T-87300	P.C.B., Volume	1
	30	VR701,751,702,752, VR703	Variable Resistor, 10 K ohm "A"x4	1
	31	VR703	Variable Resistor, 20K ohm "W"	1
	R330	4-222R-61100	Semi-fixed Resistor, 5K ohm, MPX	1
	R318	4-222T-42500	Semi-fixed Resistor, 250K ohm, AM AGC	1
	CT101	4-224T-05200	Trimmer	1
	CT102,103	4-224T-00100	Trimmer	1
	C715,765,795	4-223T-03800, 4-223T-03810	Capacitor, 1000pF	3

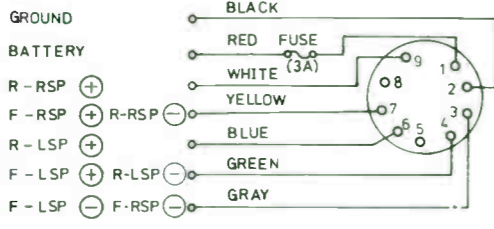
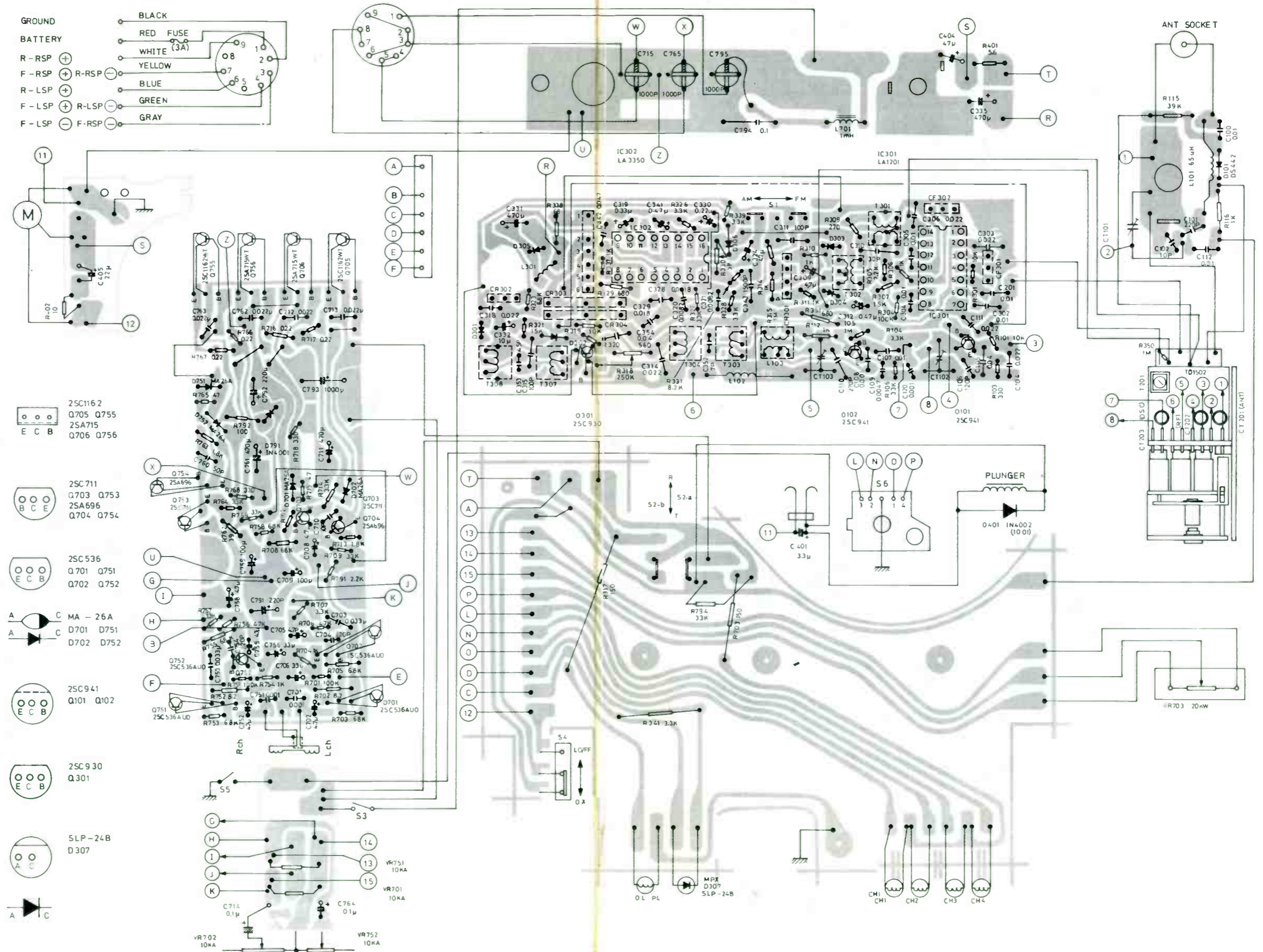
PARTS LIST

Schematic Location	Description	Q'ty	Key No.	Part No.	Description	Q'ty
CAPACITORS			MECHANISM (AT-8063)			
C352	Ceramic, 7pF, ±0.5pF, 50V	1	1	141-0-311T-204911	Chassis Assembly	1
C102	Ceramic, 10pF, ±10%, 50V	1	2	141-2-378T-07500	Bracket Motor	1
C310	Ceramic, 30pF, ±10%, 50V	1	3	141-0-821T-00200	Tape Guide Assembly	1
C353	Ceramic, 45pF, ±10%, 50V	1	4	141-0-571T-00700	Bearing Axis Assembly	1
C311,315	Ceramic, 100pF, ±10%, 50V	2	5	141-0-521T-05600	Flywheel Assembly	1
C106	Ceramic, 120pF, ±10%, 50V	1	6	141-2-564T-16300	Belt	1
C101	Ceramic, 220pF, ±10%, 50V	1	7	141-2-661T-69102, 141-2-661T-69103 or 141-2-661T-69104	Pulley, Motor	1
C100,107, 301,302, 304,305, 112	Ceramic, 0.01μF, +80 -20%, 50V	7	8			
C104,111, 303,314, 318	Ceramic, 0.022μF, +80 -20%, 50V	5	9	141-0-853T-417910	Screw, Headless, 2.6x5mm Spring Plate Assembly, Side Pressure	1 1
C105,354	Ceramic, 0.04μF, +80 -20%, 50V	2	10	141-2-461T-25700	Pipe, Motor	1
C108	Mylar, 0.001μF, ±20%, 50V	1	11	141-0-375T-06391	Bracket, Head Assembly	1
C109	Mylar, 0.0047μF, ±20%, 50V	1	12	147-2-851T-00900	Spring Coil, Azimuth	1
C320,321	Mylar, 0.0082μF, ±20%, 50V	2	13	141-2-375T-06200	Bracket, Head	1
C328,329	Mylar, 0.018μF, ±20%, 50V	2	14	141-2-352T-13901	Spacer, Head Earth	1
C306	Mylar, 0.022μF, ±20%, 50V	1	15	141-2-851T-89600	Spring Coil	1
C342	Mylar, 0.047μF, ±20%, 50V	1	16	141-2-671T-05000	Cam	1
C110	Styrol, 270pF, ±5%, 125V	1	17	141-2-851T-89500	Spring Coil	1
C343	Styrol, 1500pF, ±5%, 125V	1	18	141-2-764T-01400	Brush, Channel	1
C330	Electrolytic, 0.22μF, 10V	1	19	141-2-352T-14400	Spacer, Brush	1
C319	Electrolytic, 0.33μF, 10V	1	20	141-0-351T-33491	Bracket Mounting Assembly	1
C312,341	Electrolytic, 0.47μF, 10V	2	21	141-2-411T-07400	Plate Nut	1
C309,324	Electrolytic, 4.7μF, 16V	2	22			
C332	Electrolytic, 10μF, 16V	1	23	141-2-351T-33202	Bracket Mounting	1
C331	Electrolytic, 470μF, 10V	1	24	141-2-741T-92301	Lever	1
C335	Electrolytic, 470μF, 16V	1	25	141-2-741T-81101	Lever	1
C710,760	Ceramic, 50pF, ±20%, 50V	2	26	141-2-851T-92600	Spring Coil, Bracket Mounting	1
C704,754	Ceramic, 220pF, ±20%, 50V	2	27	141-2-851T-46200	Spring Coil, Lever mtg.	1
C794	Ceramic, 0.1μF, +80 -20%, 50V	1	28	141-2-352T-16500	Spacer, Magnetic Coil mtg.	1
C701,751	Mylar, 0.001μF, ±20%, 50V	2	29			
C712,762, 713,763	Mylar, 0.022μF, ±20%, 50V	4	30	141-2-352T-16700	Spacer, Cam	1
C703,753	Mylar, 0.033μF, ±20%, 50V	2	31	4-242T-19100	Magnetic Head	1
C714,764	Electrolytic, 0.1μF, 10V	2	32	4-264T-06300	Magnetic Coil	1
C702,752, 705,755, 708,758	Electrolytic, 4.7μF, 10V	6	33	4-226T-80300	P.C.B., Channel	1
C706,756	Electrolytic, 33μF, 6.3V	2	34	4-527T-09000	Motor	1
C404	Electrolytic, 47μF, 16V	1	35	141-2-472T-05801	Lug, Head Lead mtg. Felt Washer, 9x13x2mm, Bearing Axis	1 1
C709,759	Electrolytic, 100μF, 6.3V	2	37	123-2-472R-00400	Lug, Earth	2
C791,792	Electrolytic, 220μF, 16V	2	38	123-2-472T-00600	Lug, Head Lead mtg.	1
C711,761	Electrolytic, 470μF, 10V	2	39	4-226T-95600	P.C. Board, Motor	1
C793	Electrolytic, 1000μF, 16V	1	40		Push Nut, 2.5x10x0.15mm, Gear	1
			41	141-2-457T-09200	Special Washer, 4.5x9x1mm, Gear	2
			42			
			43	141-6-474T-02500	Identification Label	1
			C401		Electrolytic, 3.3μF, 16WV	1
			D401		Diode, 1N4002 or 10D-1	1
					Electrolytic, 22μF, 16WV	1
					Solid, 10 ohm, ¼W	1
			MECHANISM SCREWS			
			Y01		Screw, Pan Hd., 2.6x8mm	1
			Y02		Screw, Pan Hd., 2.6x4mm	2
			Y03		Screw, Pan Hd., 2.6x10mm	1
			Y04		Screw, Pan Hd., 3x8mm	1
			Y05		Screw, Pan Hd., 2.6x12mm	1
			Y06		Tapping Screw, Pan Hd., 3x6mm	4
			Y07		Tapping Screw, Pan Hd., 3x8mm	1
			Y08		Tapping Screw, Pan Hd., 3x20mm	1
			Y09		Screw, Pan Hd., 3x12mm	2
			Y10		Washer, 3x6x0.5mm	1
			Y11		Washer, 3x8x0.5mm	1
			Y12		Tapping Screw, Flat Hd., 3x8mm	4
			Y13		"E" Ring, 4mm	1
			Y14		Graphite Nylon Washer, 3x5.4x0.25mm	3
			Y15		Graphite Nylon Washer, 6.5x13x1mm	1
			Y16		Tapping Tight Screw, 2.5x6mm	1
			Y17		Spring Washer, 2.6mm	1
			Y18		Spring Washer, 3mm	2
			Y19		Washer, 3x6x1mm	3

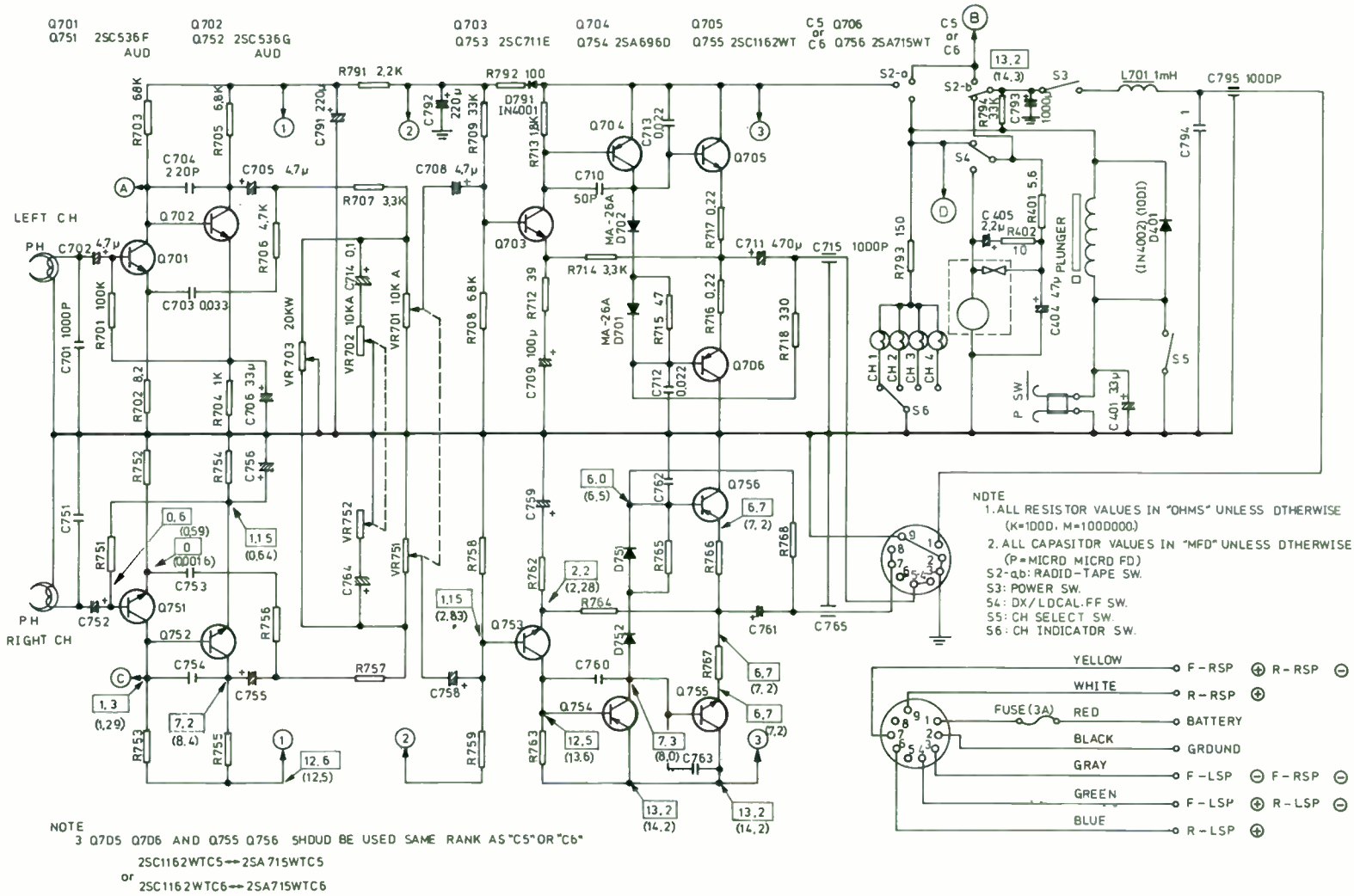
SCHEMATIC DIAGRAM (TUNER)

Sanyo FT872

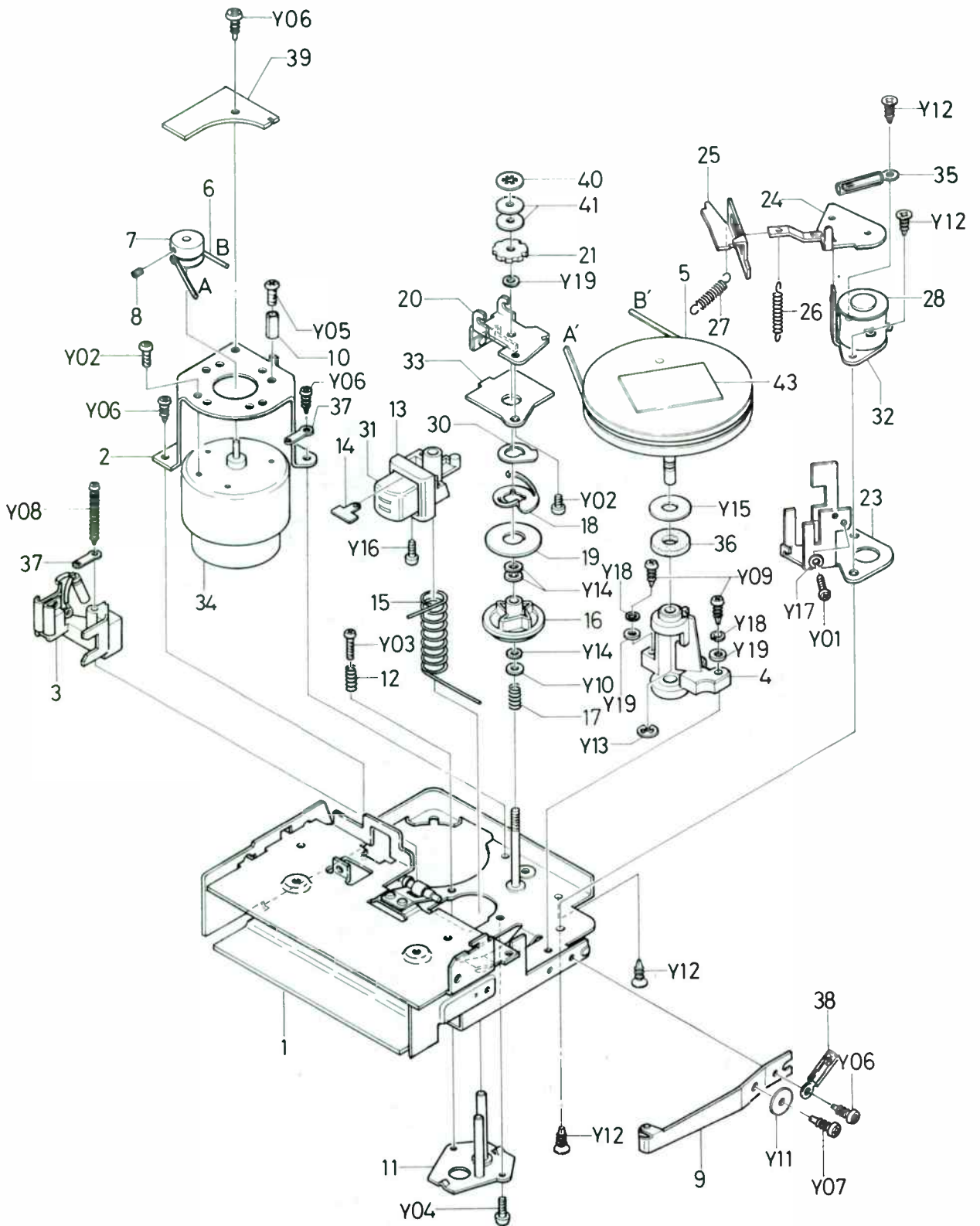




5857



EXPLODED VIEW (MECHANISM)



INDEX

Listing all models in Auto Radio Series volumes from 1970 (AR-70).
For models covered before 1970, see the Annual Index.

Denotes Sams Publication Out Of Print.

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OPF4671	AR-172
OPF4672	AR-172
OPF4673	AR-172
OPF4674	AR-172
OPF4675	AR-172
OPF4676	AR-172
OPF4677	AR-172
OPF4678	AR-172
OPF4679	AR-172
OPF4680	AR-172
OPF4681	AR-172
OPF4682	AR-172
OPF4683	AR-172
OPF4684	AR-172
OPF4685	AR-172
OPF4686	AR-172
OPF4687	AR-172
OPF4688	AR-172
OPF4689	AR-172
OPF4690	AR-172
OPF4691	AR-172
OPF4692	AR-172
OPF4693	AR-172
OPF4694	AR-172
OPF4695	AR-172
OPF4696	AR-172
OPF4697	AR-172
OPF4698	AR-172
OPF4699	AR-172
OPF4700	AR-172
OPF4701	AR-172
OPF4702	AR-172
OPF4703	AR-172
OPF4704	AR-172
OPF4705	AR-172
OPF4706	AR-172
OPF4707	AR-172
OPF4708	AR-172
OPF4709	AR-172
OPF4710	AR-172
OPF4711	AR-172
OPF4712	AR-172
OPF4713	AR-

CLARION (CONT.)

Table listing parts for CLARION (CONT.) with columns for part number, description, and price.

COBRA

Table listing parts for COBRA with columns for part number, description, and price.

COMET

Table listing parts for COMET with columns for part number, description, and price.

CONTINENTAL

Table listing parts for CONTINENTAL with columns for part number, description, and price.

CORTINA

Table listing parts for CORTINA with columns for part number, description, and price.

CORVETTE

Table listing parts for CORVETTE with columns for part number, description, and price.

CORVAIR

Table listing parts for CORVAIR with columns for part number, description, and price.

COUGAR

Table listing parts for COUGAR with columns for part number, description, and price.

CRAIG

Table listing parts for CRAIG with columns for part number, description, and price.

CRANWOOD

Table listing parts for CRANWOOD with columns for part number, description, and price.

CROWN

Table listing parts for CROWN with columns for part number, description, and price.

DART

Table listing parts for DART with columns for part number, description, and price.

DELCO

Table listing parts for DELCO with columns for part number, description, and price.

DESOTO

Table listing parts for DESOTO with columns for part number, description, and price.

DOGE

Table listing parts for DOGE with columns for part number, description, and price.

DOLPHIN

Table listing parts for DOLPHIN with columns for part number, description, and price.

DYNATRONICS

Table listing parts for DYNATRONICS with columns for part number, description, and price.

EDSEL

Table listing parts for EDSEL with columns for part number, description, and price.

FALCON

Table listing parts for FALCON with columns for part number, description, and price.

FO-MO-CO

Table listing parts for FO-MO-CO with columns for part number, description, and price.

FORD

Table listing parts for FORD with columns for part number, description, and price.

FORD (CONT.)

Table listing parts for FORD (CONT.) with columns for part number, description, and price.

GENERAL MOTORS (CONT.)

Table listing parts for GENERAL MOTORS (CONT.) with columns for part number, description, and price.

GM & GMC

Table listing parts for GM & GMC with columns for part number, description, and price.

GENERAL MOTORS

Table listing parts for GENERAL MOTORS with columns for part number, description, and price.

GENERAL MOTORS (CONT.)

Table listing parts for GENERAL MOTORS (CONT.) with columns for part number, description, and price.

GENERAL MOTORS (CONT.)

Table listing parts for GENERAL MOTORS (CONT.) with columns for part number, description, and price.

GENERAL MOTORS (CONT.)		GENERAL MOTORS (CONT.)		GENERAL MOTORS (CONT.)		GENERAL MOTORS (CONT.)		GENERAL MOTORS (CONT.)		GENERAL MOTORS (CONT.)	
22FT411	AR-112	34BFM4	AR-172	52AFP1	AR-189	70HPBK1	AR-239	7307303	AR-71	7930033	AR-98
22GFMI	AR-113	34BFM11	AR-145	52AFP1K1	AR-189	70HPBT1/2	AR-239	7307312	AR-71	*7930035	AR-96
*22GFP1/2	AR-120	34BPB1	AR-140	52AFP2	AR-193	71BPB1	AR-246	7307321	AR-74	*7930035 (1971)	AR-96
*22GFPK1	AR-120	34BPB1/2	AR-144	52APBT1/2	AR-192	71BPBK1	AR-239	7307332 (1972)	AR-114	*7930035 (1971 1/2 Prod)	AR-118
*22GFPK2	AR-120	34BPBT1	AR-138	52APBT3	AR-213	71GUPB1	AR-253	*7307332 (1972 1/2 Prod.)	AR-239	7930061 (1972)	AR-115
*22GPB1	AR-114	34FMT1	AR-145	52BFT1	AR-213	71GUPB1/2	AR-253	7307332 (1971 Prod.)	AR-126	*7930061 (1972 1/2 Prod.)	AR-125
*22GPBK1	AR-114	52BFT1/2	AR-127	52BFT2	AR-215	71GVFK1 (Sim. to Pg. 85)	AR-189	7307332 (1969 Prod.)	AR-72	7930063 (1972 Prod.)	AR-117
*22GPBK2	AR-126	52FMT3	AR-215	52FMT3	AR-215	71HBPT1/2	AR-246	7307402 (1971 Prod.)	AR-97	7930063 (1971 Prod.)	AR-97
22KA	AR-138	52FPM1	AR-189	52FPM1	AR-189	71HMF1/2	AR-245	*7307402 (1971 1/2 and 1972 Prod.)	AR-240	7930063 (1971 1/2)	AR-117
22K11	AR-111	52FPM1/2	AR-189	52FPM1K1	AR-186	71HMF1/2	AR-245	7307412	AR-73	7930069 (1972 Prod.)	AR-117
23AFM1	AR-112	52BK1	AR-217	52BK2	AR-217	71SFB1/2	AR-251	*7307432 (1971 1/2 and 1972 Prod.)	AR-251	*7930121 (1971-1/2 Prod.)	AR-118
23AFP1	AR-115	52BPB1	AR-193	52BPB2	AR-193	71TFPK1	AR-251	7307432/456	AR-97	7930121 (1971 Prod.)	AR-105
*23AFP2/3	AR-128	52BPBT1/2	AR-192	52BPBT1/2	AR-192	72APB1 (Sim. to Pg. 43)	AR-217	7307554 (1972 Prod.)	AR-112	*7930121	AR-104
*23APB2	AR-128	52BPBT3	AR-213	52BPBT3	AR-213	71YFMC1	AR-254	7307554 (1971 Prod.)	AR-97	7930134 (1973 Prod.)	AR-138
23AT411	AR-110	52FPM1	AR-191	52FPM1	AR-191	72AFM1	AR-242	7307702 (1972)	AR-97	*7930134 (1972-1/2 Prod.)	AR-128
*23BFM1 (Sim. to Pg. 91)	AR-110	52FPM2	AR-169	52FPM2	AR-169	72AFM2	AR-255	7307813	AR-74	7930134 (1971)	AR-100
23BFMT1	AR-117	52FMT3	AR-215	52FMT3	AR-215	72AFP1	AR-240	7307863	AR-70	7930134 (1971 1/2)	AR-114
23BFP1	AR-114	52FPB1	AR-186	52FPB1	AR-186	72APK1	AR-240	7308166 (1972 Prod.)	AR-70	*7930144 (1971 1/2 Prod.)	AR-120
23BPB1	AR-115	52FPB2	AR-217	52FPB2	AR-217	72APB1	AR-239	7308166 (1969 Prod.)	AR-73	7930144 (1971 Prod.)	AR-98
*23BPB2	AR-118	52FPBK1	AR-193	52FPBK1	AR-193	72APBK1	AR-240	7308203 (1971 1/2)	AR-71	7930161	AR-115
*23BPBT1	AR-118	52FPBK2	AR-193	52FPBK2	AR-193	72APBK1/2	AR-240	7312524 (1972 1/2 Prod.)	AR-112	*7930202 (1972)	AR-115
*23BPBT2	AR-126	52GPK1	AR-189	52GPK1	AR-189	72FPB1	AR-252	7312524 (1972 1/2 Prod.)	AR-112	*7930202 (1972 Revised)	AR-118
23FPBK1	AR-114	53AFK1	AR-193	53AFK1	AR-193	72FT41 (See Pg. 47)	AR-72	7312234 (1971 Prod.)	AR-97	7930202 (1972 1/2 Prod.)	AR-122
*24AFP1 (1/2)	AR-118	53APB2 (See Pg. 93)	AR-190	53APB2 (See Pg. 93)	AR-190	73AFM1/2	AR-250	7312234 (1972 Prod.)	AR-97	7930202 (1971)	AR-109
24AFP2/3	AR-129	53APBK1	AR-190	53APBK1	AR-190	73AFM1/3	AR-255	*7312332 (1971)	AR-106	7930212 (1972)	AR-109
24APB1	AR-115	53AFM1	AR-190	53AFM1	AR-190	73AFP1	AR-240	*7312332 (1971)	AR-106	7930212 (1971)	AR-102
*24APB2	AR-125	53BFM1/2	AR-193	53BFM1/2	AR-193	73AFP1/2	AR-239	7312892 (1972)	AR-114	7930224 (1972 1/2 Prod.)	AR-124
24BFT1	AR-118	53BFM1/3	AR-193	53BFM1/3	AR-193	73APK1	AR-240	*7312892 (1972 1/2 Prod.)	AR-126	7930224 (1971 Prod.)	AR-117
*24BFMT1	AR-120	53BFM2 (See Pg. 93)	AR-190	53BFM2 (See Pg. 93)	AR-190	73APBK1	AR-240	7312912 (1972)	AR-114	*7930234 (1972 Prod.)	AR-110
*24BFP1	AR-117	53BPM1/2	AR-193	53BPM1/2	AR-193	73CFM1/2	AR-243	*7312912 (1972 1/2 Prod.)	AR-126	7930242 (1972 1/2 Prod.)	AR-127
24BPB2	AR-124	53BPM1/3	AR-193	53BPM1/3	AR-193	73CFMT1/2	AR-243	7312912 (1971)	AR-97	7930242 (1971 1/2, 1972)	AR-101
*24BPBT1	AR-114	53BPM2 (See Pg. 93)	AR-190	53BPM2 (See Pg. 93)	AR-190	73CFM2/1/2	AR-254	*7312922 (1971 1/2 and 1972 Prod.)	AR-120	7930244 (1972 Prod.)	AR-117
*24BPBT2 (1972)	AR-114	53BPBK1 (See Pg. 93)	AR-190	53BPBK1 (See Pg. 93)	AR-190	73CFM3/1/2	AR-254	7312942	AR-97	7930244 (1971 Prod.)	AR-102
*24BPBT3 (1972 1/2)	AR-128	53BPBK2 (See Pg. 93)	AR-190	53BPBK2 (See Pg. 93)	AR-190	73CFM4/1/2	AR-247	7313091	AR-70	7930254 (1975 Prod.)	AR-192
24BT411	AR-112	53BPBT1/2	AR-195	53BPBT1/2	AR-195	73CFM5/1/2	AR-247	7313514 (24AFP213)	AR-129	7930254 (1974 Prod.)	AR-171
24P1	AR-114	53BPBK1	AR-195	53BPBK1	AR-195	73CFM6/1/2	AR-247	*7313514 (1975 Prod.)	AR-118	7930254 (1973 Prod.)	AR-139
*24PB1	AR-114	54BFP1	AR-188	54BFP1	AR-188	73CFM7/1/2	AR-247	7313522 (7677 Prod.)	AR-252	*7930254 (1972 1/2 Prod.)	AR-126
24PPB1	AR-112	54BFP1/2	AR-188	54BFP1/2	AR-188	73CFM8/1/2	AR-247	7313522 (1974 Prod.)	AR-114	7930254 (1971 Prod.)	AR-112
24PPB2	AR-127	54BFPK1	AR-188	54BFPK1	AR-188	73CFM9/1/2	AR-247	*7313522 (1972 1/2 Prod.)	AR-126	7930492 (1971)	AR-97
24PPB3	AR-127	54BFPK2	AR-188	54BFPK2	AR-188	73CFM10/1/2	AR-247	7313522 (1971)	AR-98	7930495 (1972 Prod.)	AR-112
25CFM1/2	AR-110	54BPM1 (See Pg. 85)	AR-175	54BPM1 (See Pg. 85)	AR-175	73CFM11/2	AR-247	7313532 (1975 Prod.)	AR-189	7930495 (1971 Prod.)	AR-113
25CFM2	AR-112	54BPM2	AR-175	54BPM2	AR-175	73CFM12/1/2	AR-247	*7313532 (1971 1/2 and 1972 Prod.)	AR-120	7930542 (1971)	AR-106
25CFM3	AR-112	54BPM3	AR-175	54BPM3	AR-175	73CFM13/1/2	AR-247	7313542 (1975 Prod.)	AR-191	7930631	AR-102
25CFM4	AR-112	54BPM4	AR-175	54BPM4	AR-175	73CFM14/1/2	AR-247	7313542 (1973 Prod.)	AR-191	7930134 (1973 Prod.)	AR-139
25CFM5	AR-112	54BPM5	AR-175	54BPM5	AR-175	73CFM15/1/2	AR-247	7313552 (7677 Prod.)	AR-252	7931406 (1972 1/2 Prod.)	AR-127
25CFM6	AR-112	54BPM6	AR-175	54BPM6	AR-175	73CFM16/1/2	AR-247	7313552 (1974 Prod.)	AR-114	7931406 (1971 Prod.)	AR-117
25CFM7	AR-112	54BPM7	AR-175	54BPM7	AR-175	73CFM17/1/2	AR-247	7313552 (1972 1/2 Prod.)	AR-126	7931766 (1974 Prod.)	AR-167
25CFM8	AR-112	54BPM8	AR-175	54BPM8	AR-175	73CFM18/1/2	AR-247	7313552 (1971)	AR-98	7931766 (1972 1/2 Prod.)	AR-110
25CFM9	AR-112	54BPM9	AR-175	54BPM9	AR-175	73CFM19/1/2	AR-247	7313552 (1971 1/2 and 1972 Prod.)	AR-120	*7931766 (1972 1/2 Prod.)	AR-124
25CFM10	AR-112	54BPM10	AR-175	54BPM10	AR-175	73CFM20/1/2	AR-247	7313552 (1975 Prod.)	AR-189	7932743	AR-101
25CFM11	AR-112	54BPM11	AR-175	54BPM11	AR-175	73CFM21/1/2	AR-247	7313552 (1973 Prod.)	AR-191	7932753	AR-105
25CFM12	AR-112	54BPM12	AR-175	54BPM12	AR-175	73CFM22/1/2	AR-247	7313552 (1971 1/2 and 1972 Prod.)	AR-120	7932813	AR-105
25CFM13	AR-112	54BPM13	AR-175	54BPM13	AR-175	73CFM23/1/2	AR-247	7313552 (1975 Prod.)	AR-189	7932813 (1975 Prod.)	AR-126
25CFM14	AR-112	54BPM14	AR-175	54BPM14	AR-175	73CFM24/1/2	AR-247	7313552 (7677 Prod.)	AR-252	7932813 (1972 1/2 Prod.)	AR-126
25CFM15	AR-112	54BPM15	AR-175	54BPM15	AR-175	73CFM25/1/2	AR-247	7313552 (1974 Prod.)	AR-114	7933241 (1974 Prod.)	AR-167
25CFM16	AR-112	54BPM16	AR-175	54BPM16	AR-175	73CFM26/1/2	AR-247	7313552 (1972 1/2 Prod.)	AR-126	7933241 (1972 1/2 Prod.)	AR-110
25CFM17	AR-112	54BPM17	AR-175	54BPM17	AR-175	73CFM27/1/2	AR-247	7313552 (1971)	AR-98	*7933241 (1972 Prod.)	AR-110
25CFM18	AR-112	54BPM18	AR-175	54BPM18	AR-175	73CFM28/1/2	AR-247	7313552 (1975 Prod.)	AR-189	*7933241 (1971 Prod.)	AR-116
25CFM19	AR-112	54BPM19	AR-175	54BPM19	AR-175	73CFM29/1/2	AR-247	7313552 (1973 Prod.)	AR-191	*7933241 (1975 Prod.)	AR-126
25CFM20	AR-112	54BPM20	AR-175	54BPM20	AR-175	73CFM30/1/2	AR-247	7313552 (1971 1/2 and 1972 Prod.)	AR-120	7933241 (1972 1/2 Prod.)	AR-112
25CFM21	AR-112	54BPM21	AR-175	54BPM21	AR-175	73CFM31/1/2	AR-247	7313552 (1975 Prod.)	AR-189	7933261 (1975 Prod.)	AR-191
25CFM22	AR-112	54BPM22	AR-175	54BPM22	AR-175	73CFM32/1/2	AR-247	7313552 (1973 Prod.)	AR-191	7933261 (1972 Prod.)	AR-109
25CFM23	AR-112	54BPM23	AR-175	54BPM23	AR-175	73CFM33/1/2	AR-247	7313552 (1971 1/2 and 1972 Prod.)	AR-120	7933261 (1971 Prod.)	AR-100
25CFM24	AR-112	54BPM24	AR-175	54BPM24	AR-175	73CFM34/1/2	AR-247	7313552 (1975 Prod.)	AR-189	7933271 (See Pg. 57)	AR-74
25CFM25	AR-112	54BPM25	AR-175	54BPM25	AR-175	73CFM35/1/2	AR-247	7313552 (7677 Prod.)	AR-252	7933271 (1975 Prod.)	AR-193
25CFM26	AR-112	54BPM26	AR-175	54BPM26	AR-175	73CFM36/1/2	AR-247	7313552 (1974 Prod.)	AR-114	7933281 (See Pg. 19)	AR-74
25CFM27	AR-112	54BPM27	AR-175	54BPM27	AR-175	73CFM37/1/2	AR-247	7313552 (1972 1/2 Prod.)	AR-126	7933281 (1975 Prod.)	AR-192
25CFM28	AR-112	54BPM28	AR-175	54BPM28	AR-175	73CFM38/1/2	AR-247	7313552 (1971)	AR-98	7933281 (7918PBK1)	AR-239
25CFM29	AR-112	54BPM29	AR-175	54BPM29	AR-175	73CFM39/1/2	AR-247	7313552 (1973 1/2 Prod.)	AR-145	7933281 (1975 Prod.)	AR-187
25CFM30	AR-112	54BPM30	AR-175	54BPM30	AR-175	73CFM40/1/2	AR-247	7313552 (1975 Prod.)	AR-189	7933291 (1974 Prod.)	AR-165
25CFM31	AR-112	54BPM31	AR-175	54BPM31	AR-175	73CFM41/1/2	AR-247	7313552 (1973 Prod.)	AR-137	7933291 (1973 Prod.)	AR-137
25CFM32	AR-112	54BPM32	AR-175	54BPM32	AR-175	73CFM42/1/2	AR-247	7313552 (1972 1/2 Prod.)	AR-112	7933291 (1973 1/2 Prod.)	AR-145
25CFM33	AR-112	54BPM33	AR-175	54BPM33	AR-175	73CFM43/1/2	AR-247	7313552 (1971 1/2 and 1972 Prod.)	AR-120	*7933291 (1972 1/2 Prod.)	AR-112
25CFM34	AR-112	54BPM34	AR-175	54BPM34	AR-175	73CFM44/1/2	AR-247	7313552 (1975 Prod.)	AR-189	7933291 (1971 Prod.)	AR-120
25CFM35	AR-112	54BPM35	AR-175	54BPM35	AR-175	73CFM45/1/2	AR-247	7313552 (1973 Prod.)	AR-191	7933301 (1975 Prod.)	AR-191
25CFM36	AR-112	54BPM36	AR-175	54BPM36	AR-175	73CFM46/1/2	AR-247	7313552 (1971 1/2 and 1972 Prod.)	AR-120	7933301 (1975 Prod.)	AR-191
25CFM37	AR-112	54BPM37	AR-175	54BPM37	AR-175	73CFM47/1/2	AR-247	7313552 (1975 Prod.)	AR-189	7933301 (1973 Prod.)	AR-138
25CFM38	AR-112	54BPM38	AR-175	54BPM38	AR-175	73CFM48/1/2	AR-247	7313552 (1973 Prod.)	AR-191	7933301 (1973 Prod.)	AR-138
25CFM39	AR-112	54BPM39	AR-175	54BPM39	AR-175	73CFM49/1/2	AR-247	7313552 (1971 1/2 and 1972 Prod.)	AR-120	7933301 (1973 Prod.)	AR-138
25CFM40	AR-112	54BPM40	AR-175	54BPM40	AR-175	73CFM50/1/2	AR-247	7313552 (1975 Prod.)	AR-189	7933301 (1973 Prod.)	AR-138
25CFM41	AR-112	54BPM41	AR-175	54BPM41	AR-175	73CFM51/1/2	AR-247	7313552 (1973 Prod.)	AR-191	7933301 (1973 Prod.)	AR-138
25CFM42	AR-112	54BPM42	AR-175	54BPM42	AR-175	73CFM					

GENERAL MOTORS (CONT.)

Table listing General Motors car models and their corresponding AR numbers. Includes models like 7935021, 7935022, 7935023, etc.

GENERAL MOTORS (CONT.)

Table listing General Motors car models and their corresponding AR numbers. Includes models like 9343026, 9343051, 9343061, etc.

HUSKEE

Table listing Huskee car models and their corresponding AR numbers. Includes models like #TM104M, #60-299, HY-GAIN, etc.

KRACO (CONT.)

Table listing Kraco car models and their corresponding AR numbers. Includes models like KID560D, KID565, KID565A/66, etc.

MEDALLION (CONT.)

Table listing Medallion car models and their corresponding AR numbers. Includes models like 65-532, 65-534, 65-540, etc.

MUNTZ/STEREO (CONT.)

Table listing Muntz/Stereo car models and their corresponding AR numbers. Includes models like PU423A01, PU427B02, PU428A01, etc.

PORSCHE (CONT.)	REALISTIC (CONT.)	SEARS-SILVERTONE (CONT.)	TOYOTA	TRUETONE (CONT.)	VOLKSWAGEN (CONT.)
5VW1327 (Sapphire XVIII)	12-1819	AR-164	CR122FT/27FT	ITC7004A07	Fastback Squareback
AR-155	12-1822	AR-158	CR201FCT, FUT	AR-111	AR-130
5VW1419	12-1825	AR-158	CR251FT, FUT	AR-91	1VW2323 (Sapphire XIX)
AR-192	12-1827	AR-95	CR523FT/28FT	AR-76	AR-154
5VW2335	12-1828	AR-95	CR523FT, FUT	AR-117	1VW2427
AR-189	12-1831	AR-201	CR528FT, FUT	AR-99	AR-193
5VW3401	12-1832	AR-152	CR528FT, FUT, T	AR-150	1VW4112
AR-193	12-1833	AR-146	CR753FUTA, TA/54FUTA	AR-95	1VW4309 (Sapphire XXI)
5VW4309 (Sapphire XXI)	12-1834	AR-152		AR-159	AR-179
AR-179	12-1835	AR-156		AR-160	AR-201
5VW4412	12-1836	AR-146		AR-183	1VW4419
AR-191	12-2022/26	AR-146		AR-186	AR-191
	14-820	AR-143		AR-187	2BG
RANGER	14-821	AR-142		AR-188	2BT (R2BT)
R12PBX	14-822	AR-145		AR-189	2BV (R2BV)
R62MPX0/2/4/A00000	14-858	AR-145		AR-190	2VW1003
R71T	14-873	AR-130		AR-191	2VW1116
R100C	14-876	AR-134		AR-192	2VW1327
R102	14-878	AR-134		AR-193	2VW2109 (Sapphire XIV)
R102C0	14-879	AR-134		AR-209	3VW1116
R201M	14-894	AR-141		AR-215	5VW1327
RR19FM (IC Version)	14-896	AR-129		AR-195	5VW1419
RR22R	14-898	AR-144		AR-192	5VW1804 (MTR5011804A)
RR24PB	14-899	AR-140		AR-136	5VW2335
RR26FM				AR-106	5VW2427
RR29PB				AR-134	5VW3401
RR32/34/35MPX				AR-93	5VW4309 (Sapphire XI)
RR36PB				AR-100	5VW4412
RR42FT				AR-71	5VW4419
RR42T (See Pg. 77)				AR-134	
RR47T				AR-108	
RR47T0/2/4				AR-108	
RR53T				AR-134	
RR54T				AR-134	
RR56T				AR-134	
RR57T				AR-134	
RR59T				AR-134	
RR77T				AR-134	
RR77W				AR-134	
RR86T				AR-134	
RR93MPX				AR-134	
RR104C				AR-134	
RR201M				AR-134	
RR203				AR-134	
RR203MPX				AR-134	
RR2003MPX				AR-134	
TC104C				AR-134	
TPB03				AR-134	
51T				AR-134	
53T				AR-134	
54T				AR-134	
77T				AR-134	
86T				AR-134	
93MPX				AR-134	
100007-151				AR-134	
100007-172				AR-134	
100007-191				AR-134	
100007-210				AR-134	
100007-224				AR-134	
100007-253				AR-134	
100007-255				AR-134	
100017-219				AR-134	
RCA					
PA424A1					
12R100(12R0100)					
12R150					
12R200					
12R210					
12R300/1					
12R490					
12R500					
12R600					
12R606					
12R607					
12R703					
12R704					
12R710					
12R800(PA424A 01)					
14T400					
14T410					
20C505					
REALISTIC					
12-1341					
12-1342					
12-1372					
12-1802					
12-1815					

PRICE CODE

AR

AR-276
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HOWARD W. SAMS & CO., INC.

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