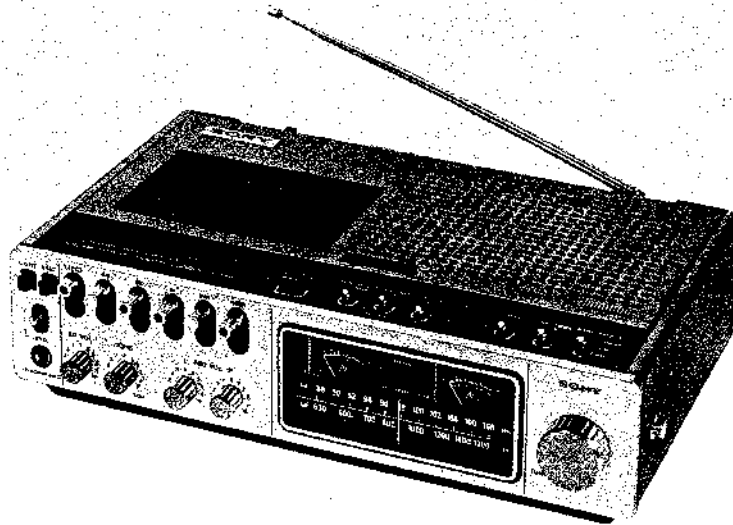


CF-540

*E Model
GEP Model*



FM/AM RADIO CASSETTE-CORDER

SPECIFICATIONS

RADIO SECTION

Frequency Range: FM 87.5 – 108 MHz
AM 530 – 1,605 kHz

Antennas: FM: Telescopic antenna
External antenna terminals
AM: Built-in ferrite-rod antenna

TAPE RECORDER SECTION

Recording System: 4-track 2-channel stereo

Tape Speed: 4.8 cm/s (1 7/8 ips)

Frequency Response: 50 – 10,000 Hz (with standard tape-cassette)
50 – 13,000 Hz (with chromium dioxide tape-cassette)

S/N Ratio: 45 dB

Total Harmonic Distortion: 2.5 %

Wow and Flutter: 0.22 %

Inputs: MIC 2 (mini jack)
sensitivity 0.2 mV (-72 dB)
for low impedance microphone

LINE IN 2 (phono jack)
sensitivity 0.06 V (-22 dB)
input impedance 560 k Ω

Outputs: LINE OUT 2 (phono jack)
rated output 0.44 V (-5 dB)
at load impedance 100 k Ω
load impedance 10 k Ω or higher

MONITOR 1 (mini jack)
rated output 0.44 V (-5 dB)
at load impedance 10 k Ω
optimum for 8 Ω earphone or load
impedance 10 k Ω or higher

HEADPHONES jack .. 1 (stereo binaural jack)
load impedance 8 Ω

Other Jacks: REC/PB 1
REMOTE 1

GENERAL

Power Requirements: 110, 127, 220, or 240 V ac, 50/60 Hz (GEP Model)
100 – 110, 115 – 127, 200 – 220, or 230 – 250 V ac,
50/60 Hz (E Model)

6V dc, four size D batteries, Rechargeable
Battery Pack BP-8H (optional), or 12 V car
battery with Sony Car Battery Cord DCC-129
(optional)

Power Consumption: 10W ac

Power Output: 1.5W (max.)

Speaker: 10cm, dia. (4 inches)

Battery Life: Approx. 7 hours of continuous recording
from the Built-in Microphone with Sony
Long-Life Batteries size D

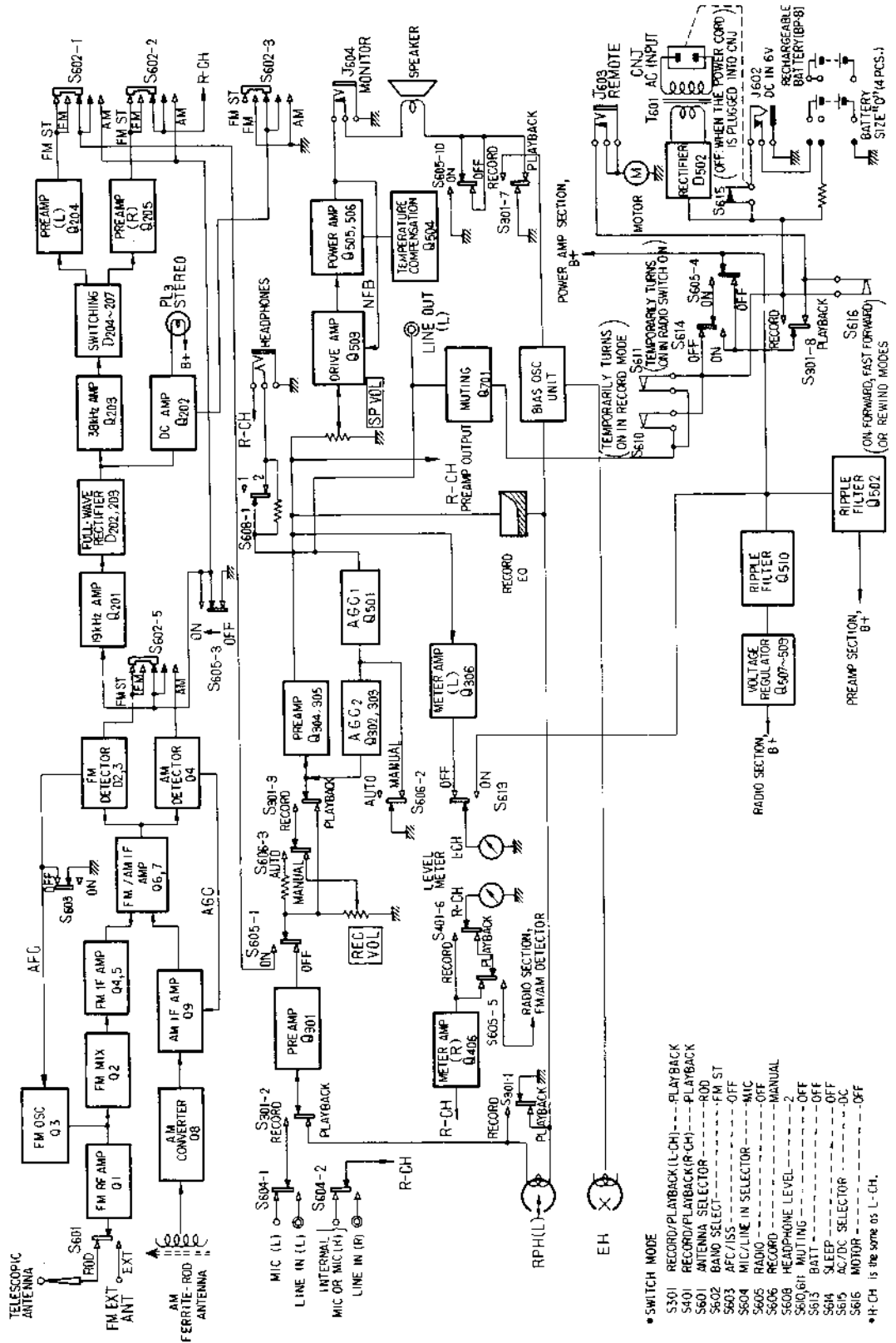
Dimensions: Approx.
370(w) x 105(h) x 240(d) mm
14 5/8 (w) x 4 1/4 (h) x 9 1/2 (d) inches
incl. projecting parts and controls

Weight: Approx. 4.9 kg (10 lb 13 oz)
with batteries

SONY

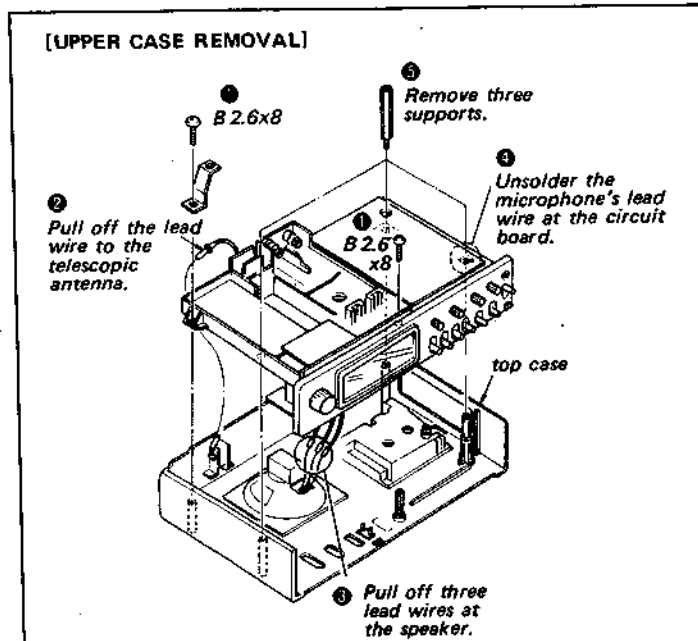
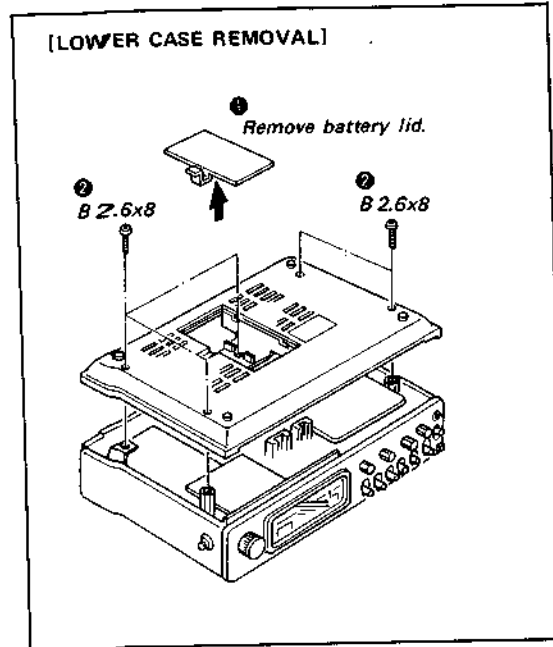
SERVICE MANUAL

1. BLOCK DIAGRAM

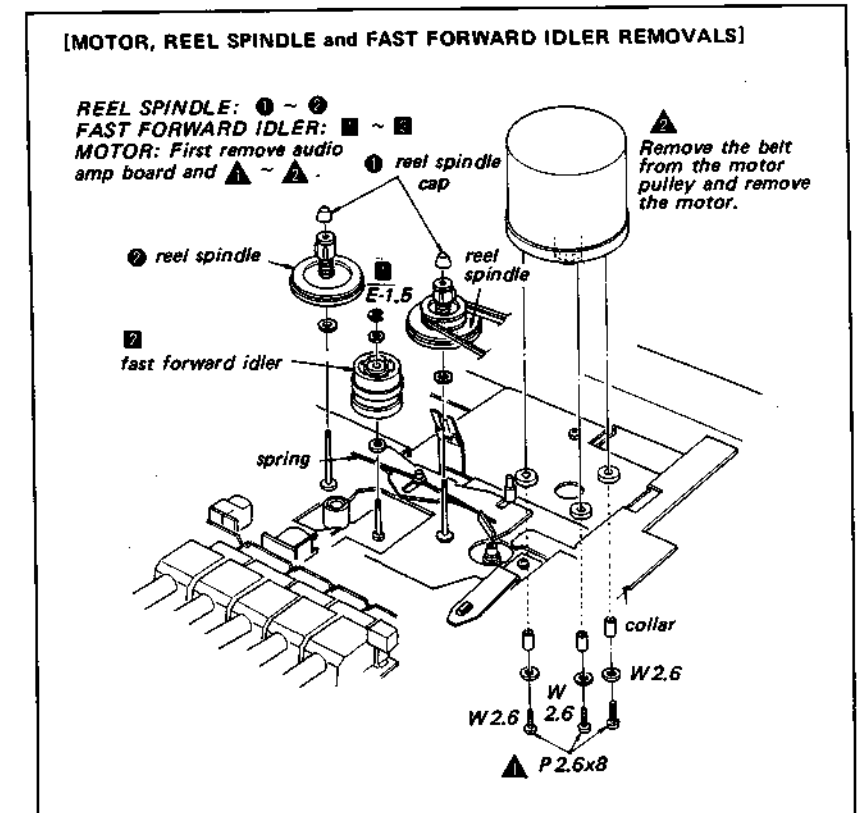
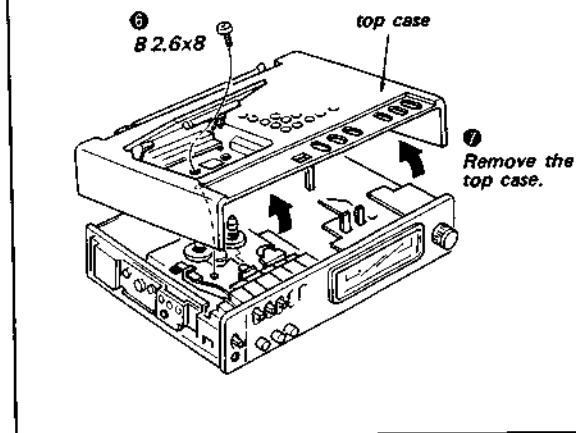
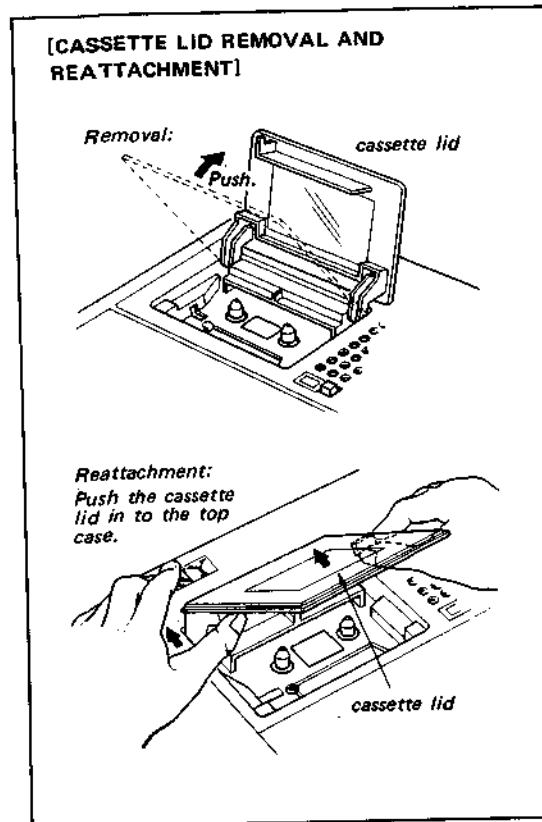
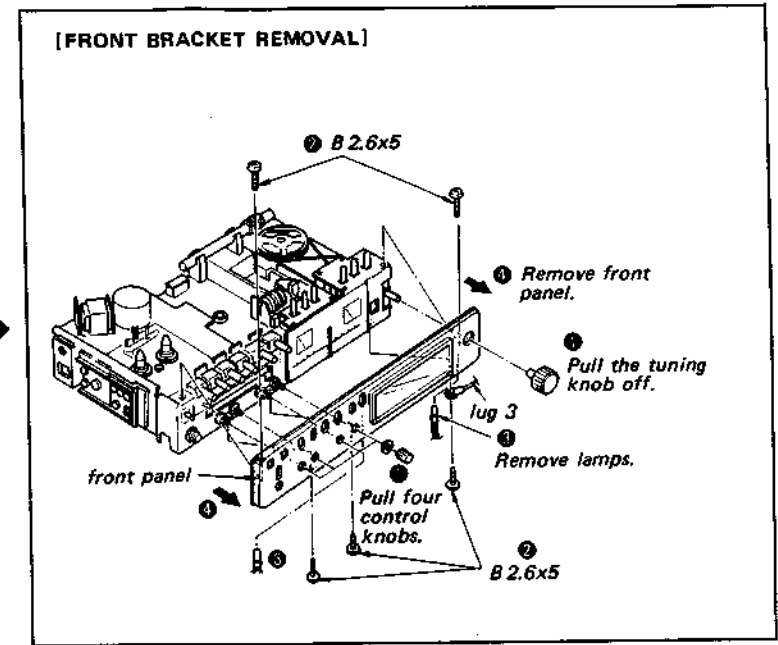


- SWITCH MODE
- S301 RECORD/PLAYBACK (L-CH) --- PLAYBACK
 - S401 RECORD/PLAYBACK (R-CH) --- PLAYBACK
 - S601 ANTENNA SELECTOR --- ROD
 - S602 BAND SELECT --- FM ST
 - S603 AFC/ISS --- OFF
 - S604 MIC/LINE IN SELECTOR --- MIC
 - S605 RADIO --- OFF
 - S606 RECORD --- OFF
 - S608 HEADPHONE LEVEL --- 2
 - S610, 611 MUTING --- OFF
 - S613 BATT --- OFF
 - S614 SLEEP --- OFF
 - S615 AC/DC SELECTOR --- DC
 - S616 MOTOR --- OFF
- R-CH is the same as L-CH.

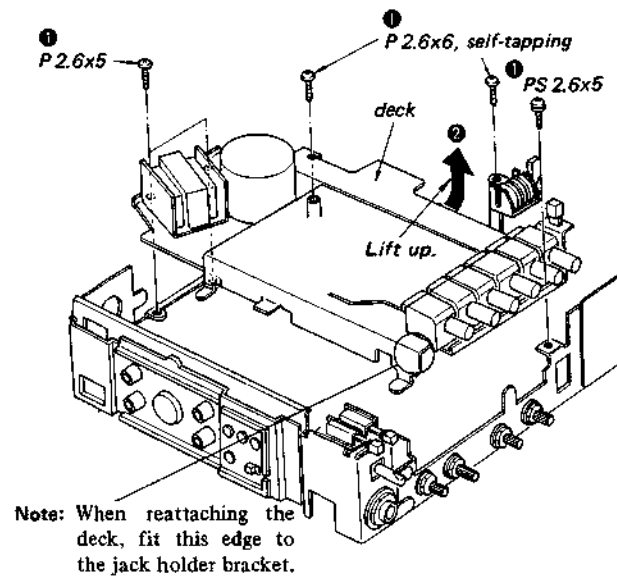
2. DISASSEMBLY



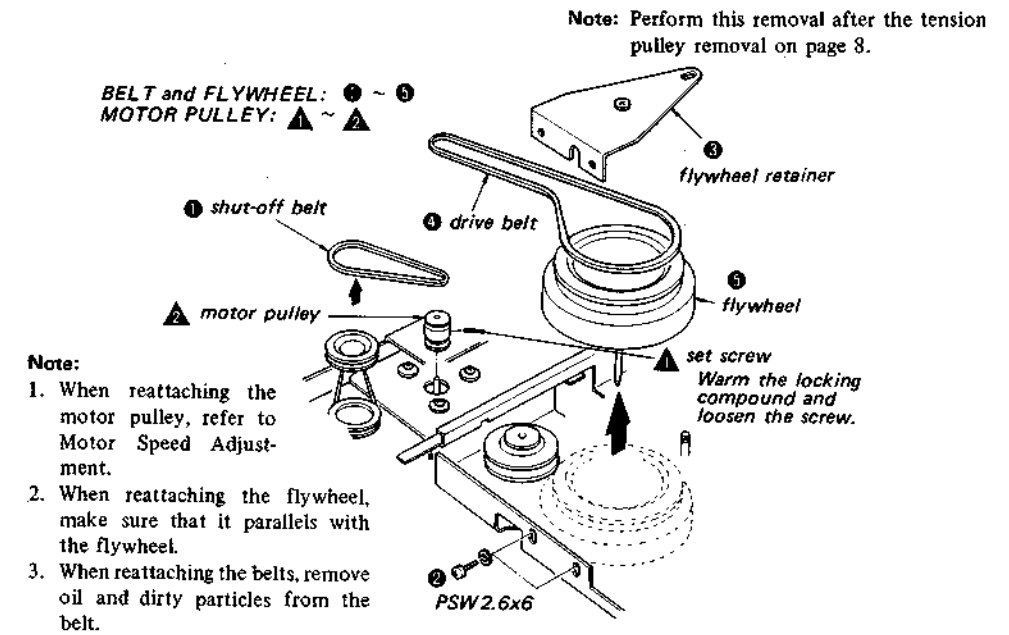
Note: When reattaching the top case, set the RADIO and SLEEP switches to ON position. Also check that PAUSE and tape counter knobs project from the appropriate holes of the top case.



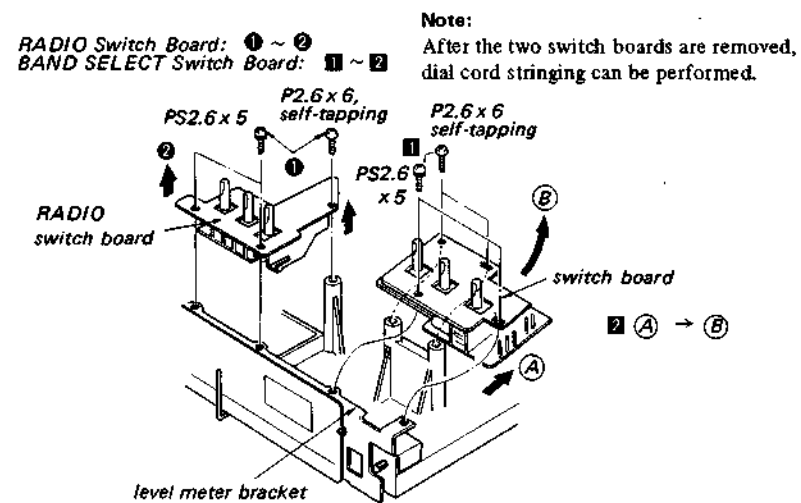
[DECK REMOVAL]



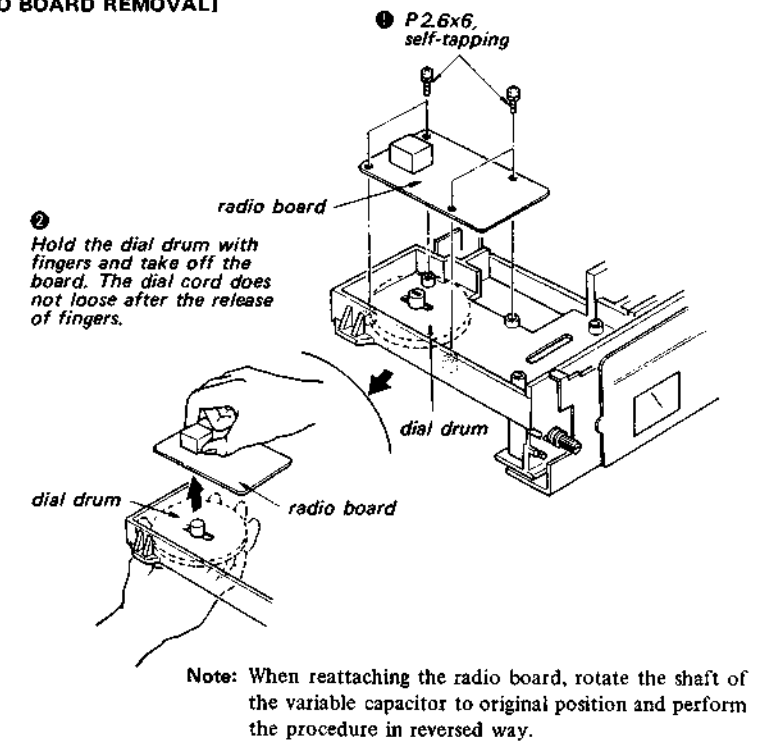
[BELT, MOTOR PULLEY and FLYWHEEL REMOVAL]

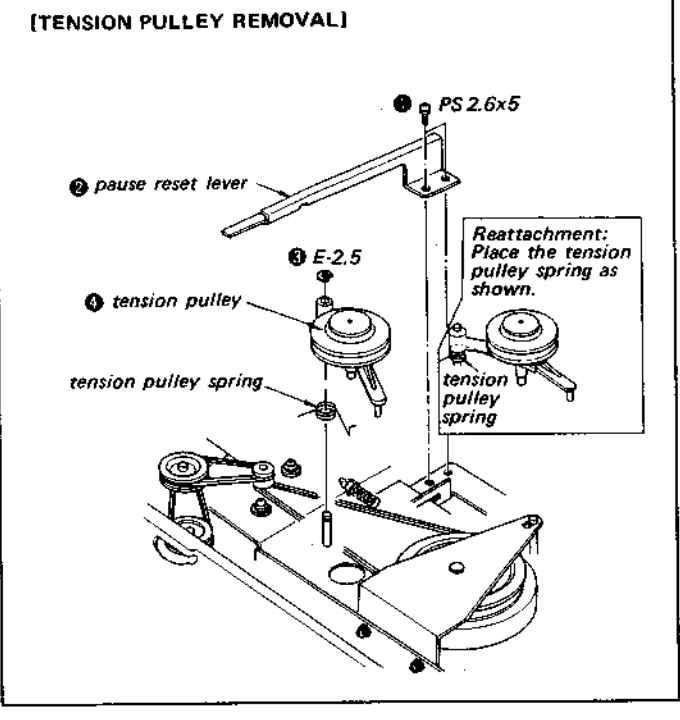
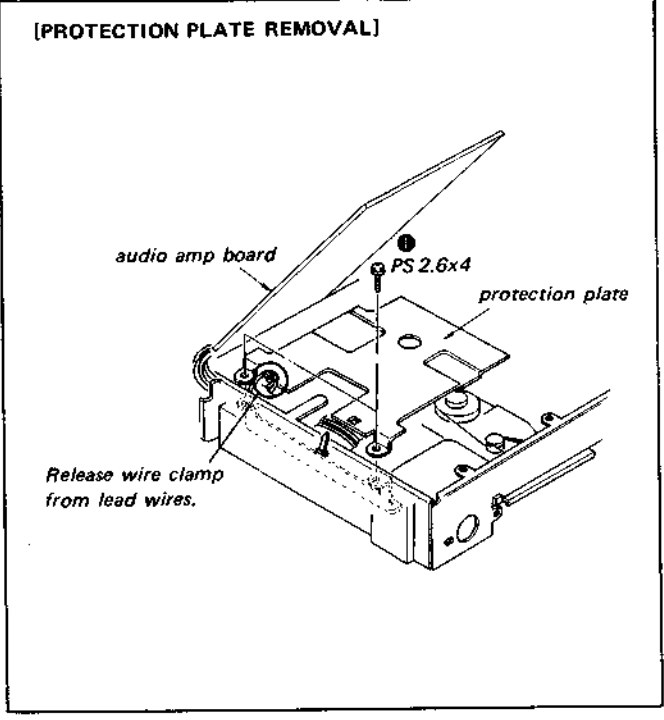
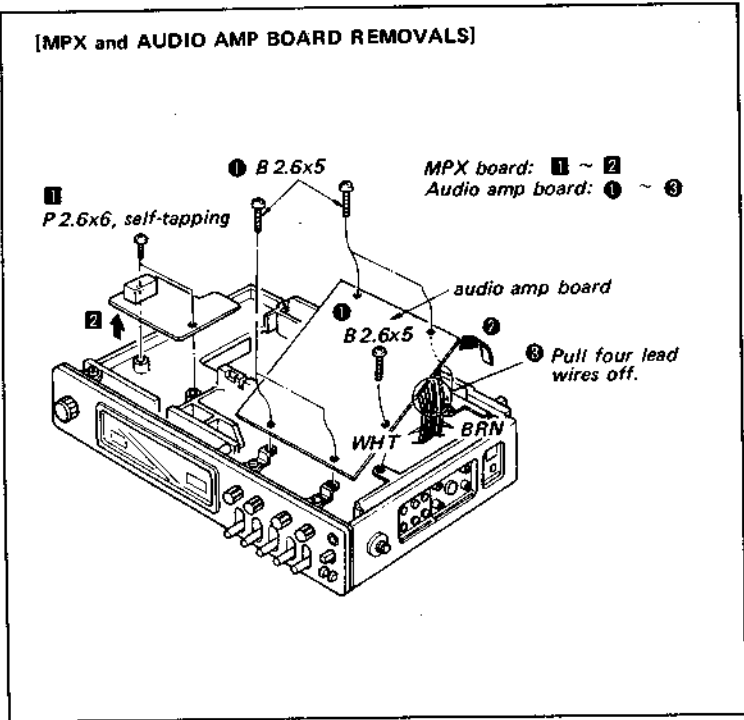


[SWITCH BOARD REMOVAL]

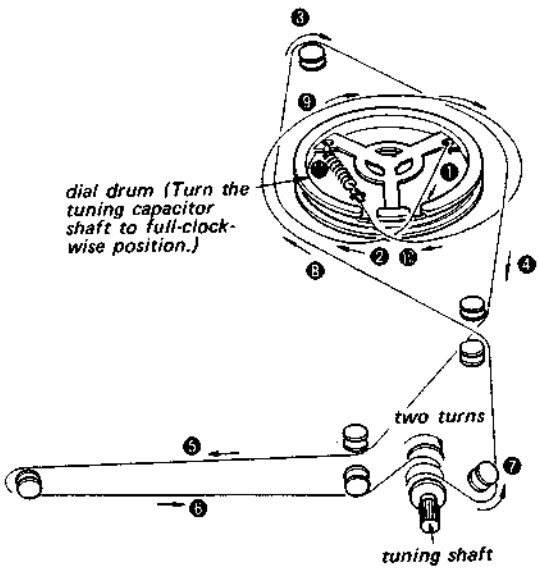
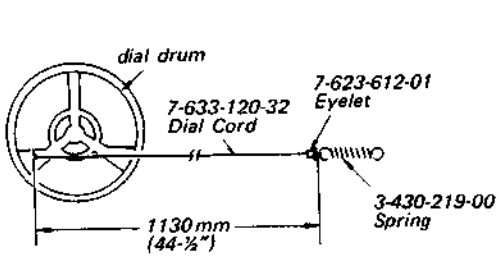


[RADIO BOARD REMOVAL]

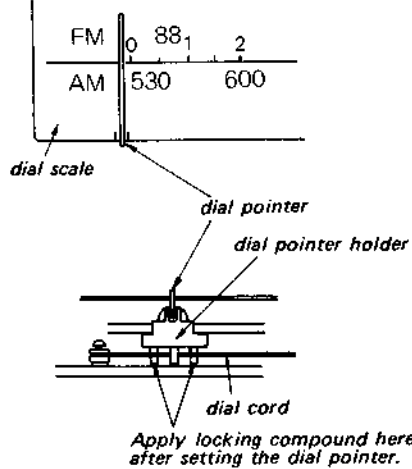




3. DIAL CORD STRINGING

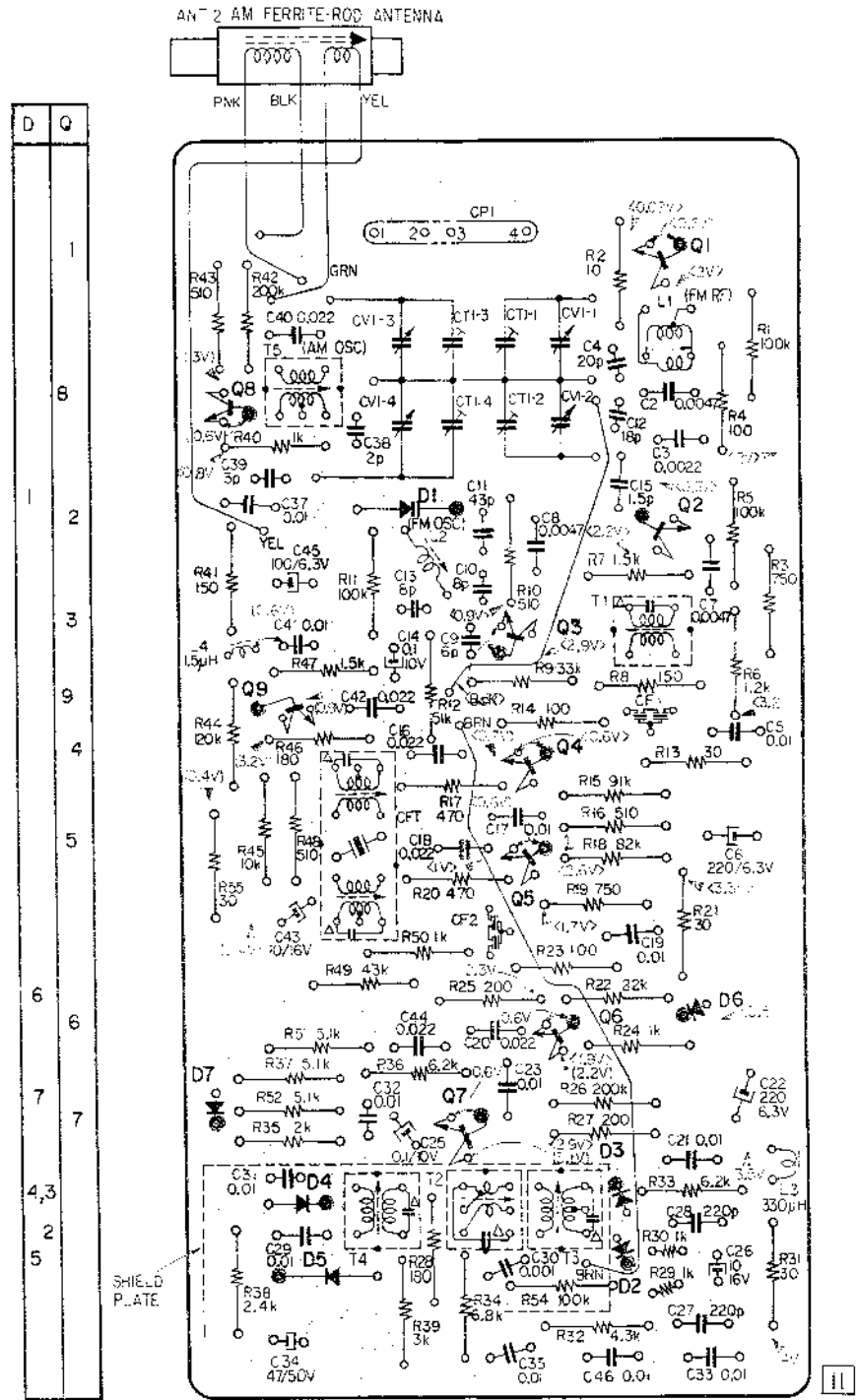


Set the tuning shaft to full-counterclockwise position.



4. MOUNTING DIAGRAM - Radio Board -

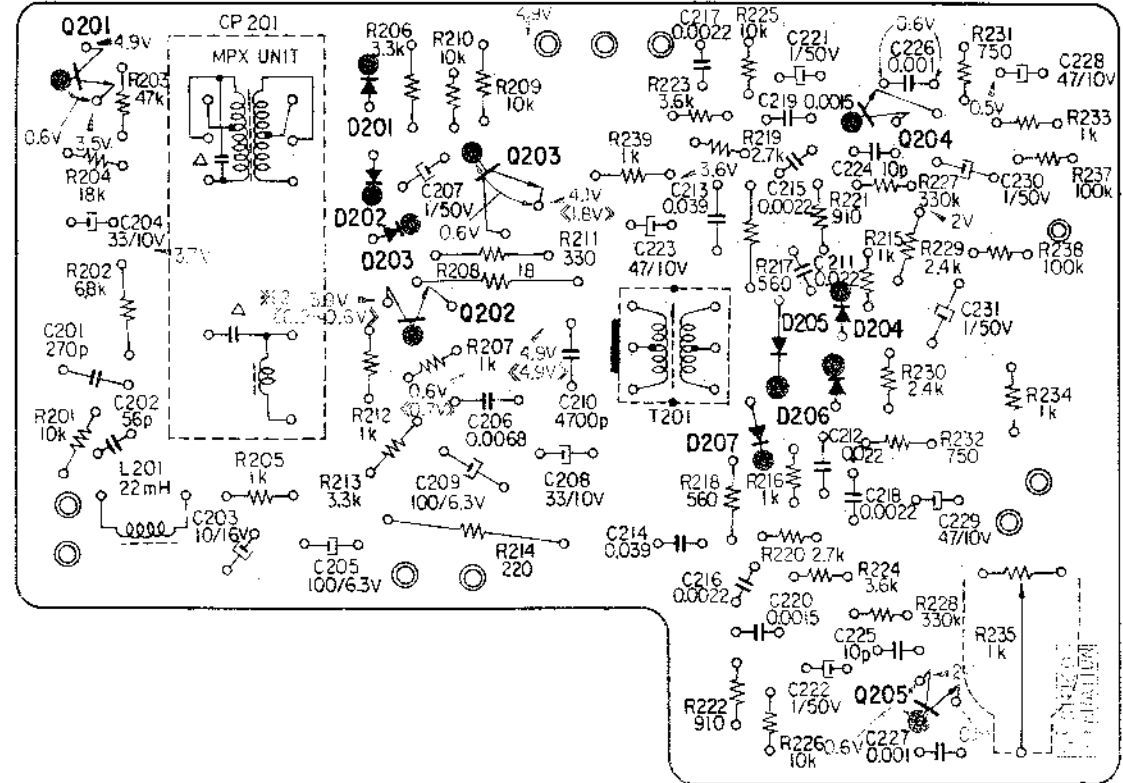
- Conductor Side -



5. MOUNTING DIAGRAM - MPX Board -

- Conductor Side -

Q	201	202	203	204	205
D		201 202	203	205 204	207 206



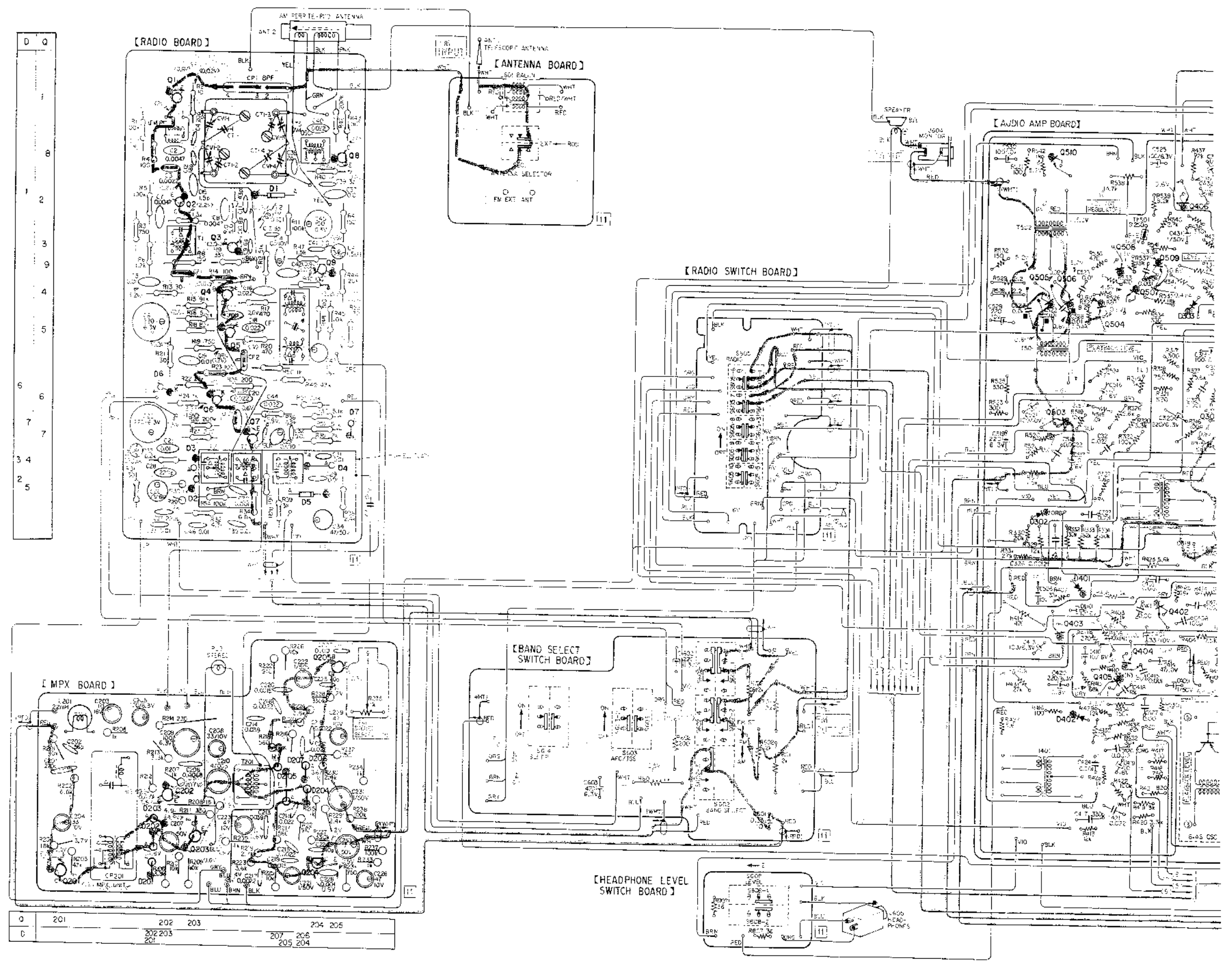
6. MOUNTING DIAGRAM

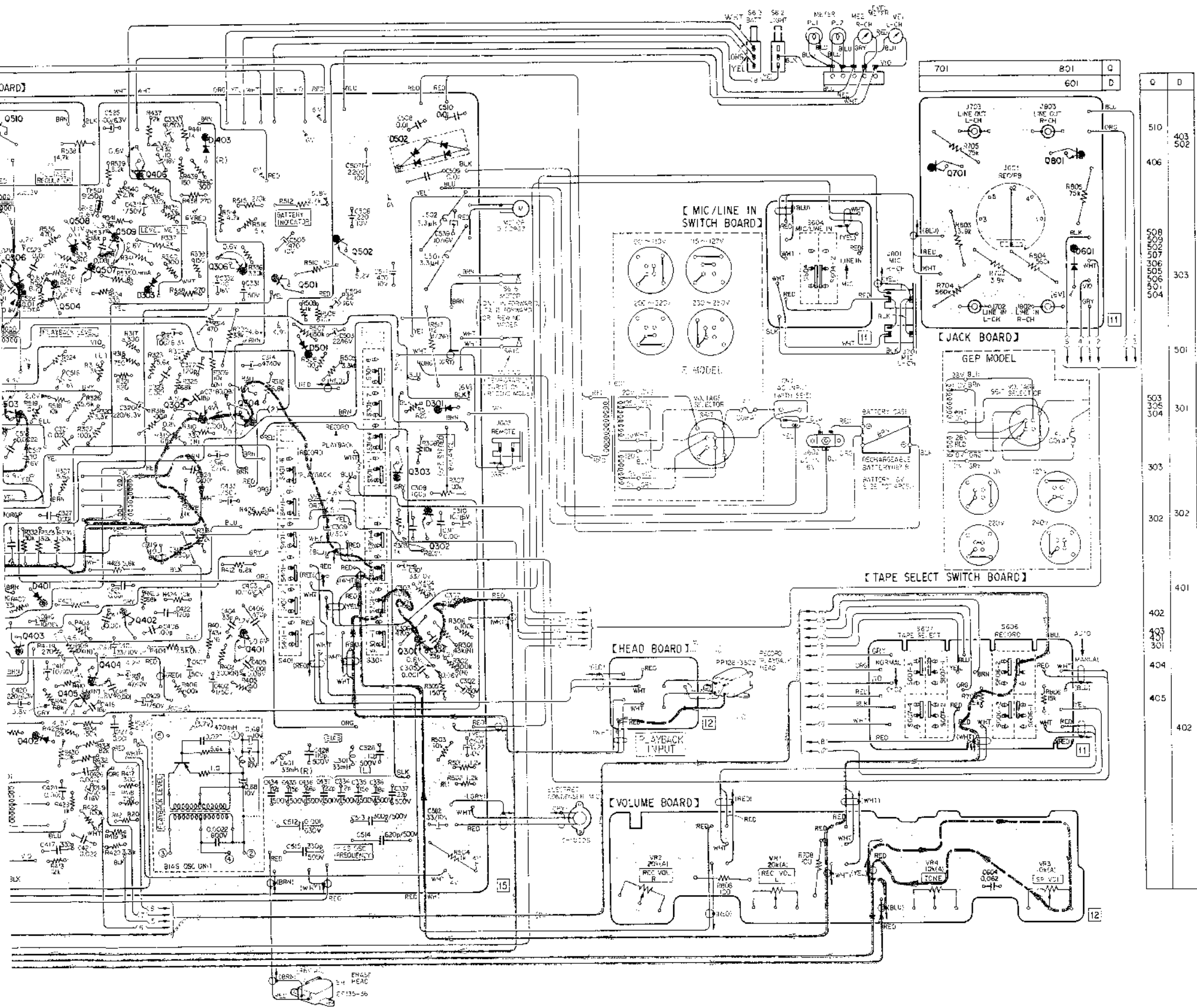
- Conductor and Component Sides -

- | | |
|-------------------------|-------------------------|
| Q1: 2SC930 | D1: 1S2687S |
| Q2, 3: 2SC668 | D2, 3, 5: 1T261 |
| | D6, 7: 1S1555 |
| | D4, 202, 203 |
| | D302, 303 1T22 |
| | D402, 403, 501 |
| | D204~207: 1T22A |
| Q4~9: 2SC710 | D201, 301, 401 CD860011 |
| | D601 |
| | |
| Q201~203 | D502: 1SRB-10 |
| Q302~306 | |
| Q402~406 | |
| Q501~504 | 2SC1363 |
| Q507, 509 | |
| Q701, 801 | |
| Q204, 205 | 2SC1361 |
| Q301, 401 | |
| | |
| Q505, 506, 510: 2SC1474 | |
| | |
| Q508: 2SA683 | |

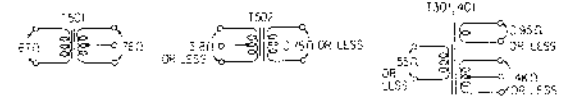
Note:

- indicates parts on the conductor side.
- Color in () indicates color of sleeving over the end portion of shielded wire.
- : signal path
- : B+ pattern





- Note:**
- All capacitors are in μF unless otherwise noted. 50 or less working volts are omitted except for electrolytic type. $\rho = \mu\text{F}$.
 - All resistors are in Ω , $\frac{1}{2}W$, unless otherwise noted. $k = 1,000$ $M = 1,000k$
 - Coil resistances are out-of-circuit values.



- Δ indicates internal components.
- --- indicates chassis ground.
- $\times 1$ Connect these points for a red-marked microphone.
- --- indicates B+ circuit.
- Voltages are DC with respect to ground unless otherwise noted. Readings are taken under no-signal conditions with a VOM (20 $k\Omega/V$). Readings in () are in record mode. $< >$: FM () : AM $\ll >$: FM STEREO no mark: common
- Voltage variations may be noted due to normal production tolerances.
- * Connect this resistor only when measuring the voltage.
- AC voltage readings on bias oscillator circuit are taken with a VTVM.
- Voltage between base and emitter are measured with 2.5V range.
- $\times 2$ Varies according to signal strength.
- Switch Mode:

Ref. No.	Switch	Position
S301-1~301-8	RECORD/PLAYBACK	PLAYBACK
S401-1~401-6	ANTENNA	ROD
S601	BAND SELECT	FM ST
S602-1~602-5	AFC/ISS	OFF
S603-1, 603-2	MIC/LINE IN	MIC
S604-1, 604-2	RADIO	OFF
S605-1~605-10	RECORD	AUTO
S606-1~606-3	TAPE SELECT	NORMAL
S607-1~607-4	LEVEL	2
S608-1, 608-2	MUTING	OFF
S610	MUTING	OFF
S611	LIGHT	OFF
S612	BATT	OFF
S613	SLEEP	OFF
S614	AC/DC	DC
S615	MOTOR	OFF
S616	VOLTAGE SELECTOR	100~110V

12. ELECTRICAL PARTS LIST

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
COMPLETE CIRCUIT BOARDS			Diode			T601	1-442-514-XX	Power (E model)	C37	1-101-923-11	0.01 ceramic
A-3266-026-A		Radio	D1		1S2687S	CFT	1-442-538-00	Power (GEP model)	C38	1-101-742-11	2 p ceramic
A-3270-001-A		Audio Amp	D2,3		1T261		1-403-144-00	CFT	C39	1-101-743-11	3 p ceramic
A-3272-002-A		MPX	D4		1T22	CAPACITORS					
			D5		1T261	All capacitors are in μ F unless otherwise indicated.					
			D6,7		1S1555	50 or less working volts are omitted except for electrolytic type (elect = electrolytic, p = μ F)					
PRINTED CIRCUIT BOARDS			D201		CD860011	C2	1-101-922-11	0.0047 ceramic	C42	1-101-924-11	0.022 ceramic
1-583-749-00		Radio Switch	D202,203		1T22	C3	1-101-919-11	0.0022 ceramic	C43	1-121-651-11	10 16 V elect
1-583-750-00		Tape Select Switch	D204~207		1T22A	C4	1-102-958-11	20 p ceramic	C44	1-101-924-11	0.022 ceramic
1-583-751-00		Band Select Switch	D301,401		CD860011	C5	1-101-923-11	0.01 ceramic	C45	1-121-413-11	100 6.3 V elect
1-583-752-00		Headphone Level	D302,303		1T22	C6	1-121-419-11	220 6.3 V elect	C46	1-101-923-11	0.01 ceramic
1-583-753-00		Mic/Line In	D402,403			C7,8	1-101-922-11	0.0047 ceramic	C47	1-102-975-11	100 p ceramic
1-583-754-00		Antenna	D501			C9	1-102-505-11	6 p ceramic	C201	1-107-141-11	270 p silvered mica
1-583-755-00		Jack	D502		S1RB10	C10	1-102-865-11	8 p ceramic	C202	1-107-125-11	56 p silvered mica
1-583-756-00		Record/Playback Head	D601		CD860011	C11	1-102-521-11	43 p ceramic	C203	1-121-651-11	10 16 V elect
1-583-757-00		Volume	TH501	1-800-198-XX	Thermistor S-1250	C12	1-101-972-11	18 p ceramic	C204	1-121-402-11	33 10 V elect
SEMICONDUCTORS			COILS			C13	1-102-865-11	8 p ceramic	C205	1-121-413-11	100 6.3 V elect
Transistor			L1	1-425-632-00	FM Rf	C14	1-127-019-11	0.1 10 V solid aluminum	C206	1-105-671-12	0.0068 mylar
Q1		2SC930	L2	1-405-705-00	FM Osc	C15	1-101-576-11	1.5 p ceramic	C207	1-121-391-11	1 50 V elect
Q2,3		2SC668	L3	1-407-175-XX	Microinductor, 330 μ H	C16	1-101-924-11	0.022 ceramic	C208	1-121-402-11	33 10 V elect
Q4~9		2SC710	L4	1-407-180-XX	Microinductor, 1.5 μ H	C17	1-101-923-11	0.01 ceramic	C209	1-121-413-11	100 6.3 V elect
Q201~203		2SC1363	L201	1-407-418-00	Microinductor, 22 mH	C18	1-101-924-11	0.022 ceramic	C210	1-103-575-11	4700 p polystyrol
Q204,205		2SC1361	L301,401	1-407-836-00	Microinductor, 33 mH	C19	1-101-923-11	0.01 ceramic	C211,212	1-105-677-12	0.022 mylar
Q301,401		2SC1361	L501,502	1-407-484-00	Microinductor, 3.3 μ H	C20	1-101-924-11	0.022 ceramic	C213,214	1-105-680-12	0.039 mylar
Q302,402		2SC1363	L601	1-417-025-00	FM EXT ANT	C21	1-101-923-11	0.01 ceramic	C215~218	1-105-665-12	0.0022 mylar
Q303~306		2SC1363	TRANSFORMERS			C22	1-121-419-11	220 6.3 V elect	C219,220	1-105-663-12	0.0015 mylar
Q403~406			T1	1-403-872-00	FM IFT	C23	1-101-923-11	0.01 ceramic	C221,222	1-121-391-11	1 50 V elect
Q501~504		2SC1363	T2	1-403-952-00	FM Discr	C24	1-102-935-11	2 p ceramic	C223	1-121-352-11	47 10 V elect
Q505,506		2SC1474	T3	1-403-953-00	FM Discr	C25	1-127-019-11	0.1 10 V solid aluminum	C224,225	1-107-107-11	10 p silvered mica
Q507		2SC1363	T4	1-403-801-00	AM IFT	C26	1-121-651-11	10 16 V elect	C226,227	1-102-074-11	0.001 ceramic
Q508		2SA683	T5	1-405-655-00	Coil, a-m osc	C27,28	1-107-093-11	220 p silvered mica	C228,229	1-121-352-11	47 10 V elect
Q509		2SC1363	T201	1-425-260-00	MPX	C29	1-101-923-11	0.01 ceramic	C230,231	1-121-391-11	1 50 V elect
Q510		2SC1474	T301,401	1-427-317-00	Output	C30	1-105-661-12	0.001 mylar	C301,401	1-121-402-11	33 10 V elect
Q701,801		2SC1363	T501	1-423-049-XX	Input	C31,32	1-105-673-12	0.01 mylar	C302,402	1-121-391-11	1 50 V elect
			T502	1-427-256-00	Output	C33	1-101-923-11	0.01 ceramic	C303,403	1-121-651-11	10 16 V elect
						C34	1-121-391-11	1 50 V elect	C304,404	1-107-119-11	33 p silvered mica
						C35	1-101-923-11	0.01 ceramic	C305,405	1-102-074-11	0.001 ceramic
									C306,406	1-107-244-11	470 p silvered mica
									C307,407	1-121-391-11	1 50 V elect
									C308,408	1-102-973-11	100 p ceramic
									C309,409	1-121-391-11	1 50 V elect
									C310,410	1-121-651-11	10 16 V elect
									C311,411	1-102-074-11	0.001 ceramic

<u>Ref. No.</u>	<u>Part No.</u>		<u>Description</u>
C313,413	1-102-413-11	100	6.3 V elect
C314,414	1-102-352-11	47	10 V elect
C315,415	1-102-074-11	0.001	ceramic
C316,416	1-121-651-11	10	16 V elect
C317,417	1-107-143-11	330 p	silvered mica
C318,418	1-107-113-11	18 p	silvered mica
C319,419	1-121-651-11	10	16 V elect
C320,420	1-121-419-11	220	6.3 V elect
C321,421	1-105-677-12	0.022	mylar
C322,422	1-107-133-11	120 p	silvered mica
C323,423 } C324,424 }	1-105-661-12	0.001	mylar
C326,426	1-105-662-12	0.0012	mylar
C327,427	1-105-661-12	0.001	mylar
C328,428	1-107-170-11	110 p	500 V silvered mica
C331,431	1-121-391-11	1	50 V elect
C332,432	1-121-651-11	10	16 V elect
C333,433	1-121-391-11	1	50 V elect
C334,434	1-107-050-11	12 p	500 V silvered mica
C335,435	1-107-051-11	15 p	500 V silvered mica
C336,436	1-107-001-11	18 p	500 V silvered mica
C337,437	1-107-052-11	22 p	500 V silvered mica
C501	1-127-020-11	0.22	10 V solid aluminum
C502	1-121-402-11	33	10 V elect
C503,504	1-121-479-11	22	16 V elect
C505	1-121-425-11	470	10 V elect
C506	1-121-420-11	220	10 V elect
C507	1-121-659-11	2200	10 V elect
C508~510	1-102-129-11	0.01	ceramic
C511	1-121-425-11	470	10 V elect
C512	1-129-702-11	0.001	630 V plastic
C513	1-107-180-11	300 p	500 V silvered mica
C514	1-107-188-11	620 p	500 V silvered mica
C515	1-107-181-11	330 p	500 V silvered mica
C516,517	1-121-651-11	10	16 V elect
C518	1-105-665-12	0.0022	mylar
C519	1-121-419-11	220	6.3 V elect
C521	1-121-414-11	100	10 V elect
C522,523	1-105-673-12	0.01	mylar
C524	1-105-661-12	0.001	mylar
C525	1-121-413-11	100	6.3 V elect

<u>Ref. No.</u>	<u>Part NO.</u>		<u>Description</u>
C526	1-127-023-11	1	10 V solid aluminum
C527,528	1-105-673-12	0.01	mylar
C529	1-121-420-11	220	10 V elect
C530	1-121-414-11	100	10 V elect
C601	1-127-021-11	0.33	10 V solid aluminum
C602	1-121-419-11	220	6.3 V elect
C604	1-105-684-12	0.082	mylar
CV1	1-151-215-XX		Tuning

RESISTORS

All resistors are in ohms. Regular-type 1/4 W carbon, composition resistors and 1/8 W carbon resistors in radio circuit board are omitted. Check the schematic diagram for the resistance values. k = 1,000, M = 1,000 k

R235	1-224-642-XX	1 k, adjustable
R307	1-222-777-11	100 k, adjustable
R538	1-222-773-11	4.7 k, adjustable
R603,604	1-224-559-00	10 k (A), variable; SP VOL, TONE
R705,805	1-224-558-00	20 k (A), variable; REC VOL

SWITCHES

S301	1-514-976-XX	Lever-slide, record/playback selector; L-CH
S401	1-514-978-XX	Lever-slide, record/playback selector; R-CH
S601	1-516-671-00	Lever-slide, antenna selector
S602	1-516-672-00	Lever-slide, BAND SELECT
S603	1-516-521-00	Lever-slide, SLEEP
S604	1-514-779-XX	Lever-slide, MIC/LINE IN
S605	1-514-969-00	Lever-slide, RADIO ON/OFF
S606,607	1-516-279-00	Lever-slide, RECORD, TAPE SELECT
S608	1-516-521-00	Lever-slide, LEVEL
S610,611	1-514-346-00	Leaf, muting
S612,613	1-516-417-XX	Push, BATT, LIGHT
S614	1-516-521-00	Lever-slide, AFC/ISS
S615		Included in connector (CNJ)
S616	1-514-792-00	Leaf, motor

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
S617	1-516-174-00	Voltage Selector (GEP model)		8-814-191-10	Electret Condenser Microphone, C-1002S
	1-516-267-00	Voltage Selector (E model)	M	8-834-009-10	Motor, D-009G
JACKS					
J601	1-509-727-00	Connector, 5 p; REC/PB	ME1	1-520-223-00	Meter, level
J602	1-507-447-XX	Connector, power	ME2	1-520-222-00	Meter, level
J603	1-507-357-00	REMOTE	PL601	1-518-169-XX	Lamp 4.5 V 40 mA
J604	1-507-251-XX	Mini, MONITOR	PL602,603	1-518-115-XX	Lamp 3 V 35 mA
J605	1-507-476-XX	Binaural, HEADPHONES			
J701,801	1-507-251-XX	Mini, MIC-L, R	EH	8-825-506-00	Head, erase; EF135-36
J702,802	1-507-378-XX	Phono, 2 p; LINE IN, LINE OUT	RPH	8-829-236-20	Head, record/playback; PP128-3602
J703,803					
CNJ	1-509-511-00	Connector 2 p; AC INPUT; includes S615 (E model)	SP	1-502-533-00	Speaker
	1-509-510-00	Connector, 2 p; AC INPUT; includes S615 (GEP model)		1-464-025-00	Bias Osc Unit
MISCELLANEOUS					
ANT1	1-501-154-00	Antenna, telescopic		1-533-102-00	Holder, fuse
ANT2	1-401-310-XX	Antenna, MW ferrite-rod		1-536-395-00	Terminal Strip
CF1,2	1-527-184-11	Filter, ceramic; 10.7 MHz		1-536-401-XX	Terminal Strip, 2L2
CP1	1-231-286-00	Band Pass Filter	ACCESSORIES		
CP201	1-425-548-00	MPX Unit	X-3701-018-2	Tips Ass'y, head cleaning	
F	1-532-084-00	Fuse 0.1 A	1-501-083-21	Antenna, feeder	
			1-504-034-12	Earphone, ME-20	
			1-528-022-00	Battery, size "D" (E model)	
			1-534-830-00	Cord, power; DK-33 (E model)	
			1-534-840-XX	Cord, power; DK-38 (GEP model)	
			3-780-834-11	Manual, instruction	