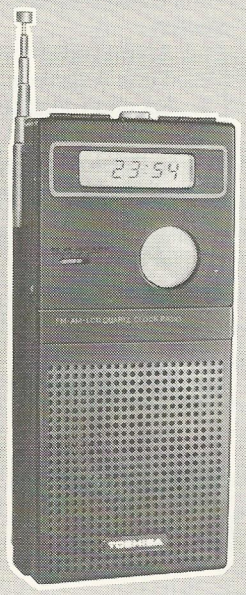
TOSHIBA

LCD QUARTZ CLOCK RADIO

QR-2000



SPECIFICATIONS

Radio Section:	
Frequency Range:	FM 87.5 – 108 MHz AM 525 – 1605 kHz
Power Output:	200mW (at 10% distortion)
Speaker:	50mm
Battery:	UM-3 ("AA" Dry Cell) x 2 DC3V
Clock Section:	
Display:	FE Type LCD
Accuracy:	±15 Seconds Per Month (at temperature 25°C constant)
Quartz Frequency:	32.768 kHz
Battery:	Silver Oxide Type G-13 or S76
Battery Life:	Approximately Two Years
General:	
Operating Temperature:	0°C – 40°C
Semiconductors:	1C-MOS LSI, 13 Transistors, 12 Diodes
Dimensions (W x H x D):	65 x 137 x 21 (mm)
Weight:	300 gr.

OPERATING CONTROLS

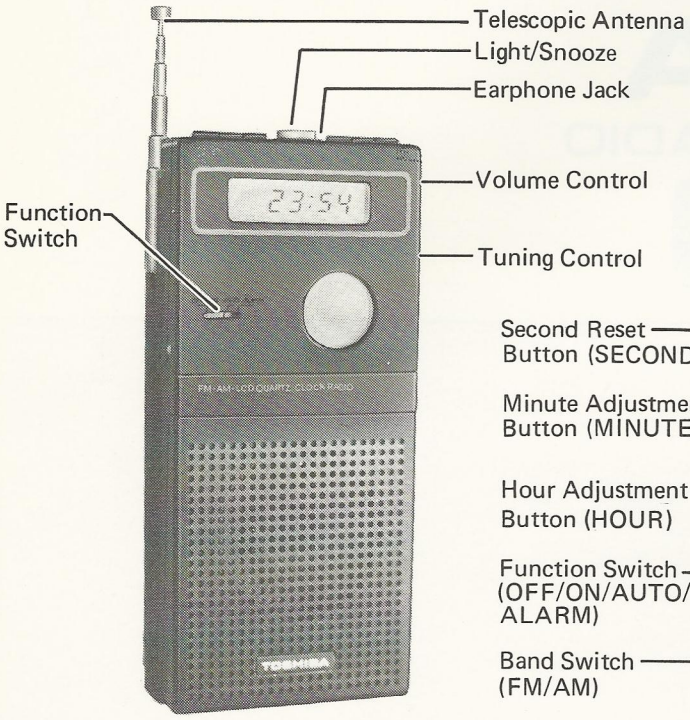


Figure 1.

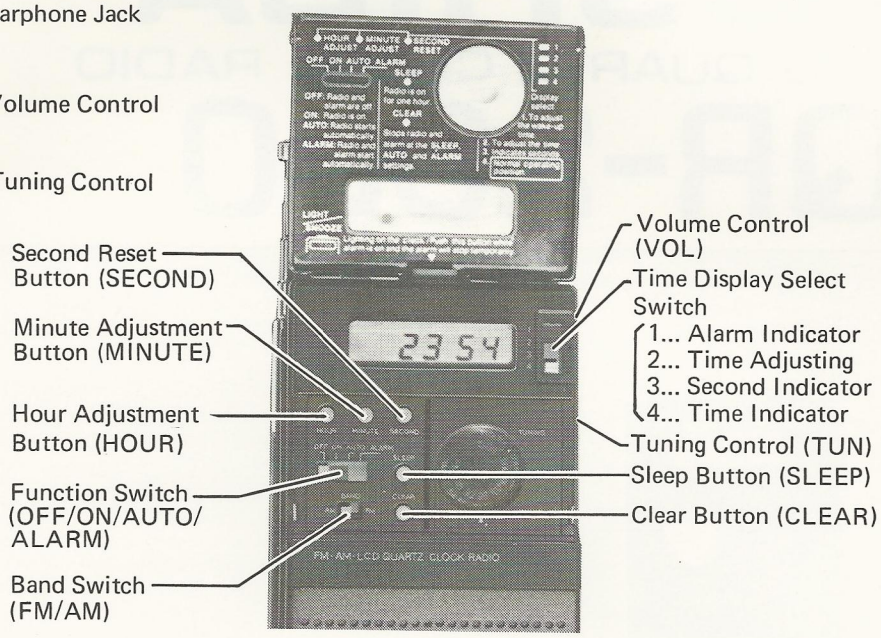


Figure 2.

DISASSEMBLY INSTRUCTIONS

BACK CABINET REMOVAL (Figure 3.)

1. Remove 4 Screws, ① and ② .
2. Remove the battery cover for radio side.
3. Separate the cabinet back from the cabinet front.
   ① ..... Screw OVL 2ϕ x 16^{mm} (BLK)
   ② ..... Screw OVL 2ϕ x 8^{mm} (BLK)

MAIN P.C. BOARD REMOVAL (Figure 4.)

1. Unsolder five points in the main P.C. Board and speaker and battery lead wires.
2. Remove the Main P.C. Board from the cabinet upward.

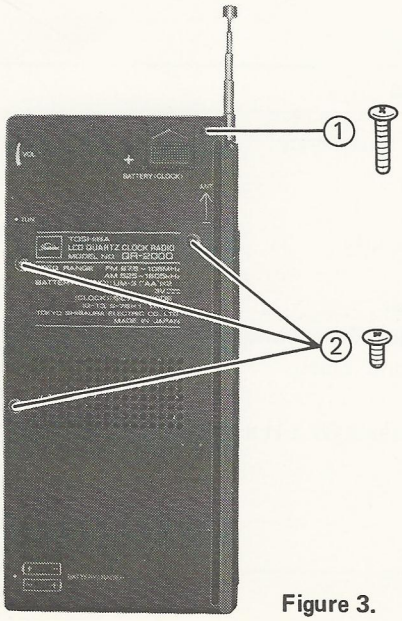


Figure 3.

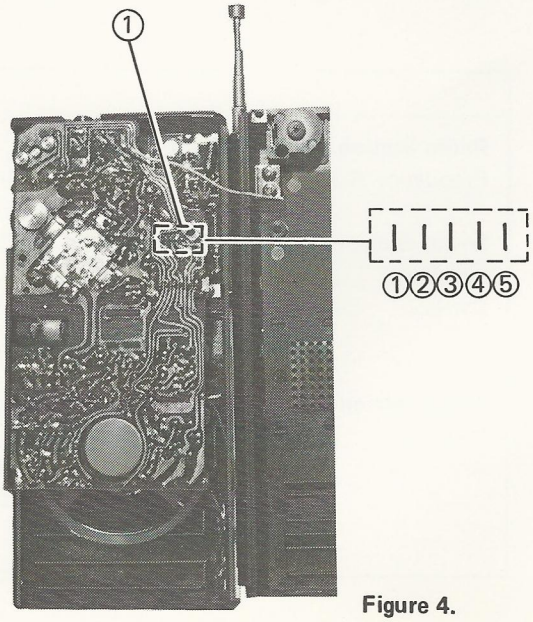


Figure 4.

CLOCK P.C. BOARD REMOVAL (Figure 5.)

1. Remove a screw ① and a stud ② .
   1 ..... Screw BID 2ϕ x 3 (BLK)
2. Separate the CLOCK P.C. Board from the cabinet front.

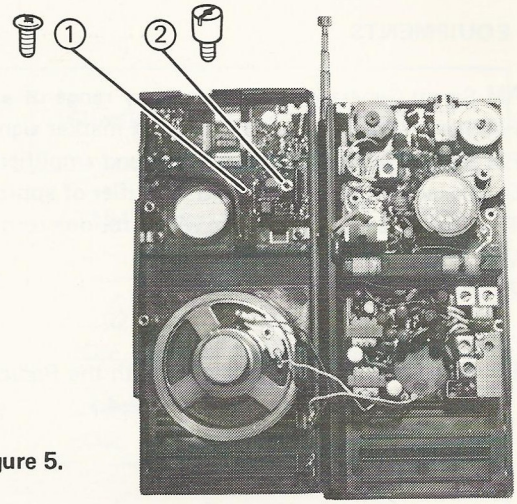


Figure 5.

DIAL CORD RESTRINGING

GENERAL

1. Remove the Dial plate.
2. Set the variable capacitor to the minimum capacitance (Plates fully open).
3. Tie the spring and dial cord as shown in the illustration.
4. Insert the dial cord through the dial pulley eye, and wind the cord as shown in the illustration.
5. Hook the spring on the drum.

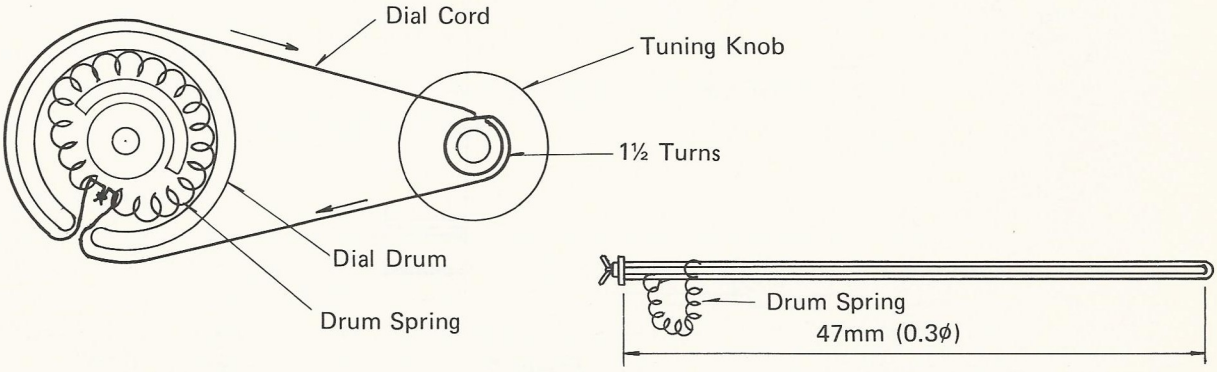


Figure 6.

CLOCK ALIGNMENT

CLOCK ALIGNMENT

After leaving the set for 30 minutes at 25°C ±5°C, rotate the trimmer capacitor to set the clock to 0 second. Proceed the above adjustment with a screwdriver through the external adjusting hole holding the Silver Oxide as illustrated.

Rotating the trimmer capacitor about by ten degrees will produce a time difference of ±0.4 second. Counterclockwise rotation puts the clock back and clockwise rotation on.

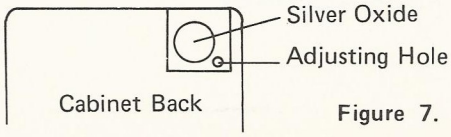


Figure 7.

5. ALIGNMENT INSTRUCTIONS

TEST EQUIPMENTS

1. AM Signal Generator with frequency range of at least from 145 kHz to 23 MHz AM.
2. FM Signal Generator with 10.7 MHz marker signal.
3. FM Sweep Generator with a wide band amplifier of approximately 500 kHz, with 10.7 MHz marker signal.
4. Oscilloscope with a wide band amplifier of approximately 100 kHz.
5. Test loop.— a coil of any size wire with one turn or more. (AM)
6. VTVM.
7. 75 ohm dummy antenna. (FM)

NOTE: When proceeding adjustment with the Radio P.C. Board separating from the Clock P.C. Board, ④ should be connected to ⑤. (See figure 4.)

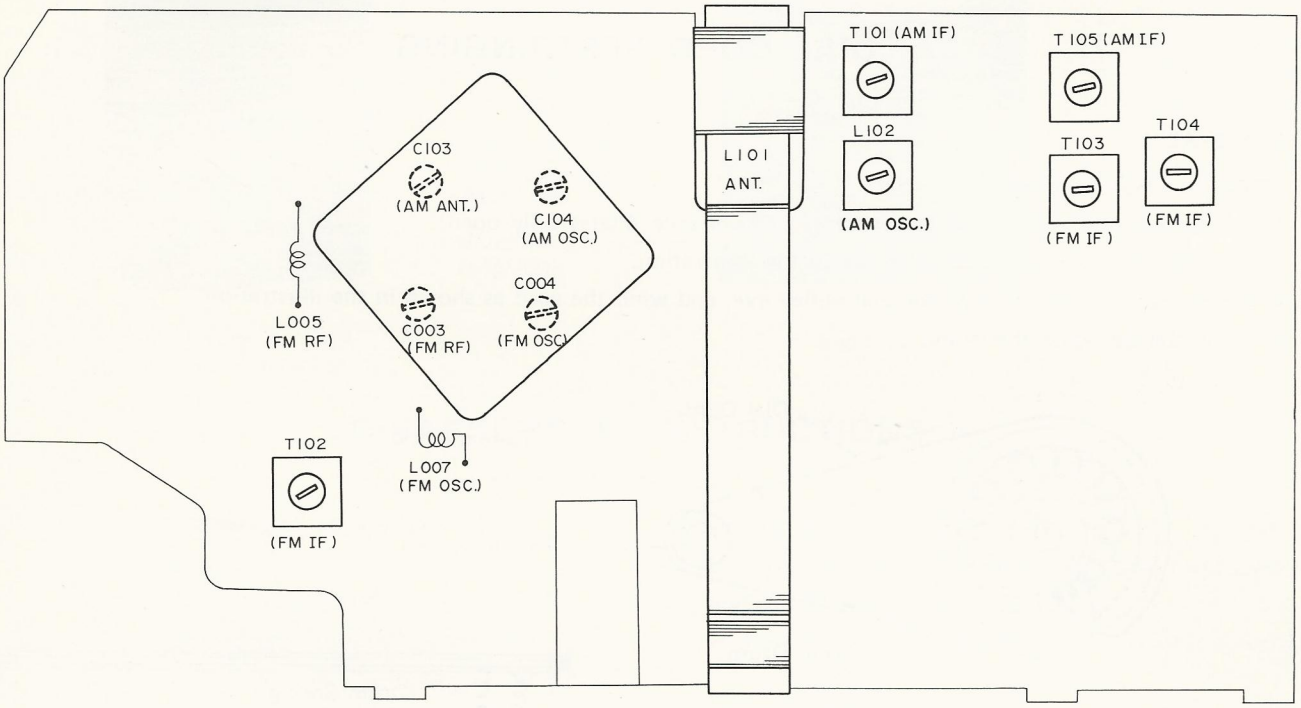


Figure 8.

AM ALIGNMENT

1. Turn on the AM signal generator and the VTVM, and allow a fifteen-minute warm-up period.
2. Using the test loop across the output of the signal generator, inductively connect the signal generator to the radio.
3. Connect the VTVM across the voice coil or an 8 ohm dummy load.
4. Set the band select switch to AM position.
5. Set the signal generator frequency as listed in AM ALIGNMENT CHART and maintain a sufficient output level to provide an indication on VTVM.
6. Set the volume control to mid-position.
7. Proceed as outlined in the AM-IF ALIGNMENT CHART.

AM ALIGNMENT CHART

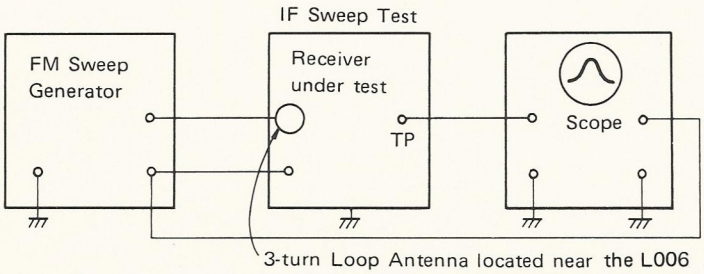
Band	Step	Signal Generator Frequency	Radio Dial Setting	Adjustment	Remarks
IF	1	460 kHz	Approximate 1000 kHz	T101, 105	Adjust for maximum indication
AM	1	515 kHz	Tuning Knob Fully Counter-clockwise (Lowest Frequency)	L102 (Osc. Coil)	Adjust for maximum indication
	2	1650 kHz	Tuning Knob Fully Clockwise (Highest Frequency)	C104 (Osc. Trim.)	Adjust for maximum indication
	3	Repeat steps 1 and 2 as required			
	4	600 kHz	Tune to Signal	L101 (Ant. Coil)	Adjust for maximum indication
	5	1400 kHz	Tune to Signal	C103 (Ant. Trim.)	Adjust for maximum indication
	6	Repeat steps 4 and 5 as required			

FM-IF ALIGNMENT

1. Set the select switch to FM position.
2. Turn on both sweep generator and oscilloscope, and allow a fifteen-minute warm-up period.
3. Connect the RF SWEEP SIGNAL OUTPUT from the signal generator through the loop antenna to the receiver.
4. Connect the oscilloscope vertical input directly to the test point TUN OUT H and connect the shielded lead to the test point E or chassis ground.
5. Connect the SWEEP VOLTAGE OUTPUT of the sweep generator to the oscilloscope.
6. Proceed as outlined in the FM-IF ALIGNMENT CHART.

FM-IF ALIGNMENT CHART

Step	Signal coupling	Equip.	Tuning	Connection	Adjust. point	Pattern
1	Connect sweep generator output to a three-turn loop antenna of 10cm diameter.	Sweep generator of 10.7 MHz center freq. with 10.7 MHz marker.	Tuning Pointer middle position	Set scope for connecting output signal from TUN OUT to vertical axis of scope "V" and sweep generator output to horizontal axis "H".	T102, T103, T104,	Turn the core of T104 counterclockwise to obtain a single peak. Adjust the core of T102 and T103 in order until the best single peak is obtained. Finally turn the core of T104 to obtain S curb.



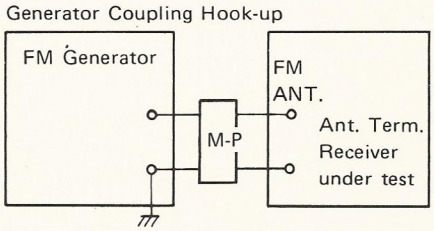


Figure 9.

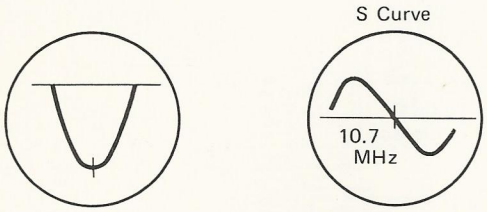


Figure 10.

FM-RF ALIGNMENT

1. Turn on the signal generator and the VTVM, and allow a fifteen-minute warm-up period.
2. Connect the signal generator output through a 75 ohm dummy antenna across FM ANT.
3. Connect the VTVM across the voice coil or an 8 ohm dummy load.
4. Set the volume control to mid-position.
5. Adjust the signal generator frequency as indicated in FM-RF ALIGNMENT CHART, and maintain a sufficient signal output level to provide a measurable indication.
6. Proceed as outlined in the FM-RF ALIGNMENT CHART.

FM-RF ALIGNMENT CHART

Step	Signal Generator	Radio Dial Setting	Adjustment	Remarks
1	87.5 MHz	Tuning Knob fully Counterclockwise (Lowest Frequency)	L007 (Osc. Coil)	Adjust for maximum output indication
2	109MHz	Tuning Knob fully Clockwise (Highest Frequency)	C004 (Osc. Trim.)	Adjust for maximum output indication
3	Repeat steps 1 and 2 as required.			
4	90MHz	Tune to signal	L005 (RF Coil)	Adjust for maximum output indication
5	106MHz		C003 (RF Trim.)	
6	Repeat steps 4 and 5 as required.			

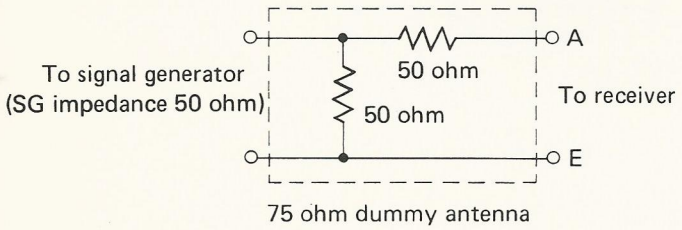


Figure 11.

CAUTION:

When realigning the FM Receiving Frequency, the lowest side of the frequency range must not be below 87.5 MHz in order to comply with FTZ regulations in West Germany.

ELECTRICAL PARTS LOCATIONS

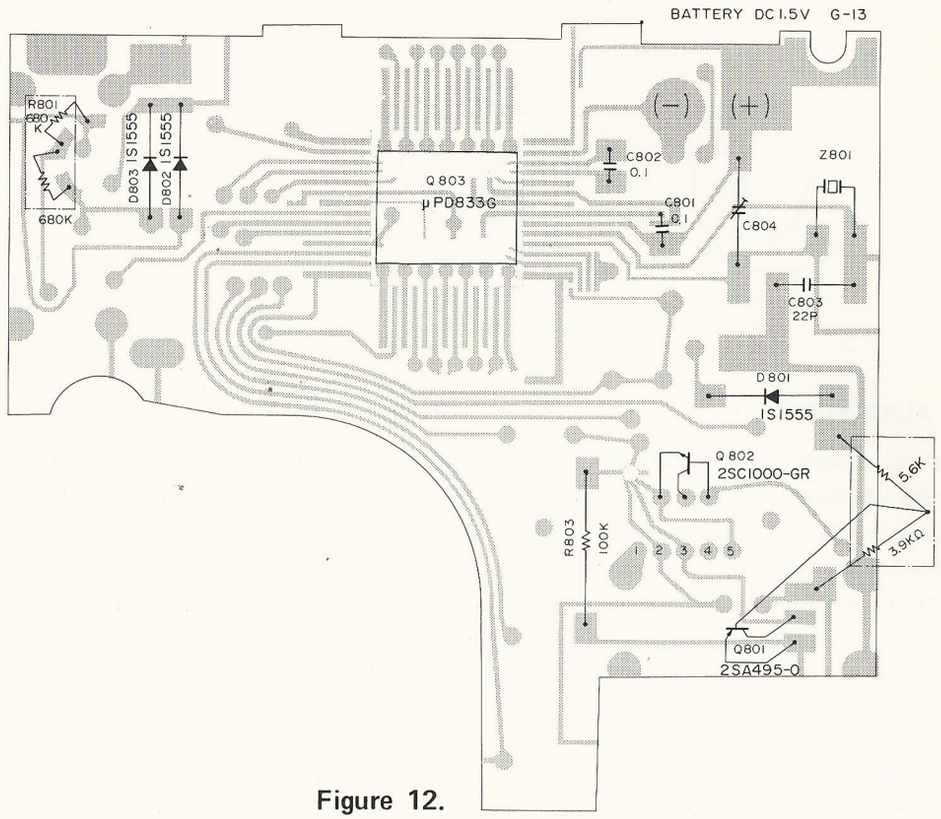


Figure 12.

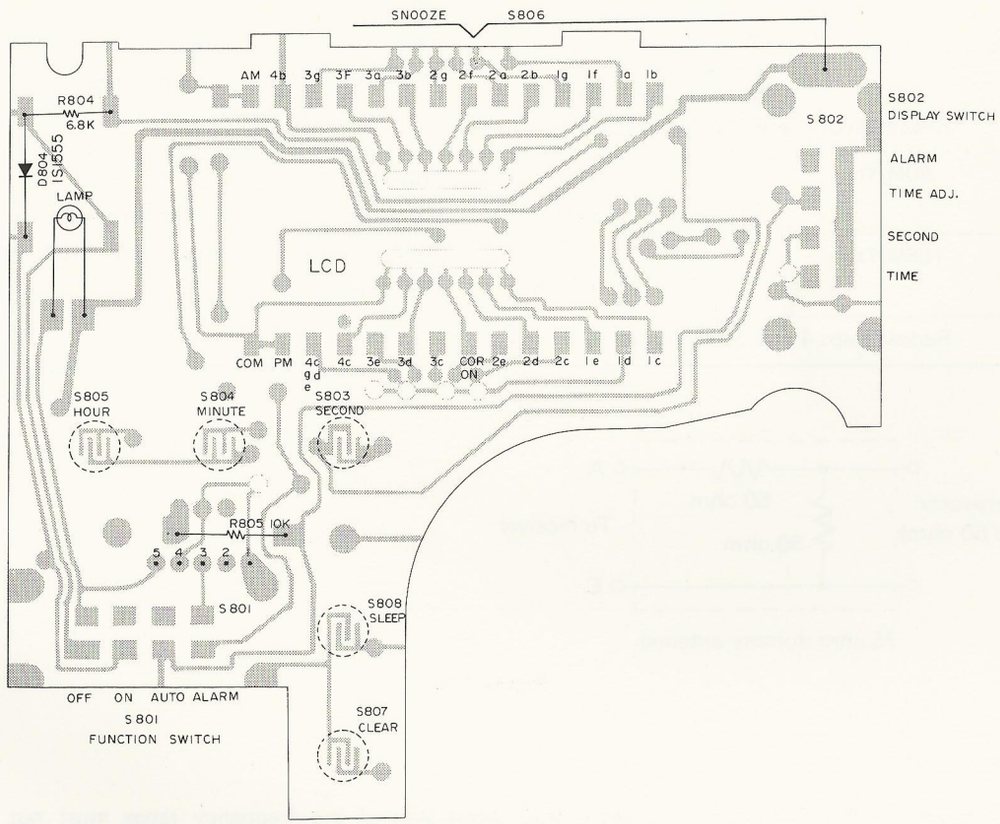


Figure 13.

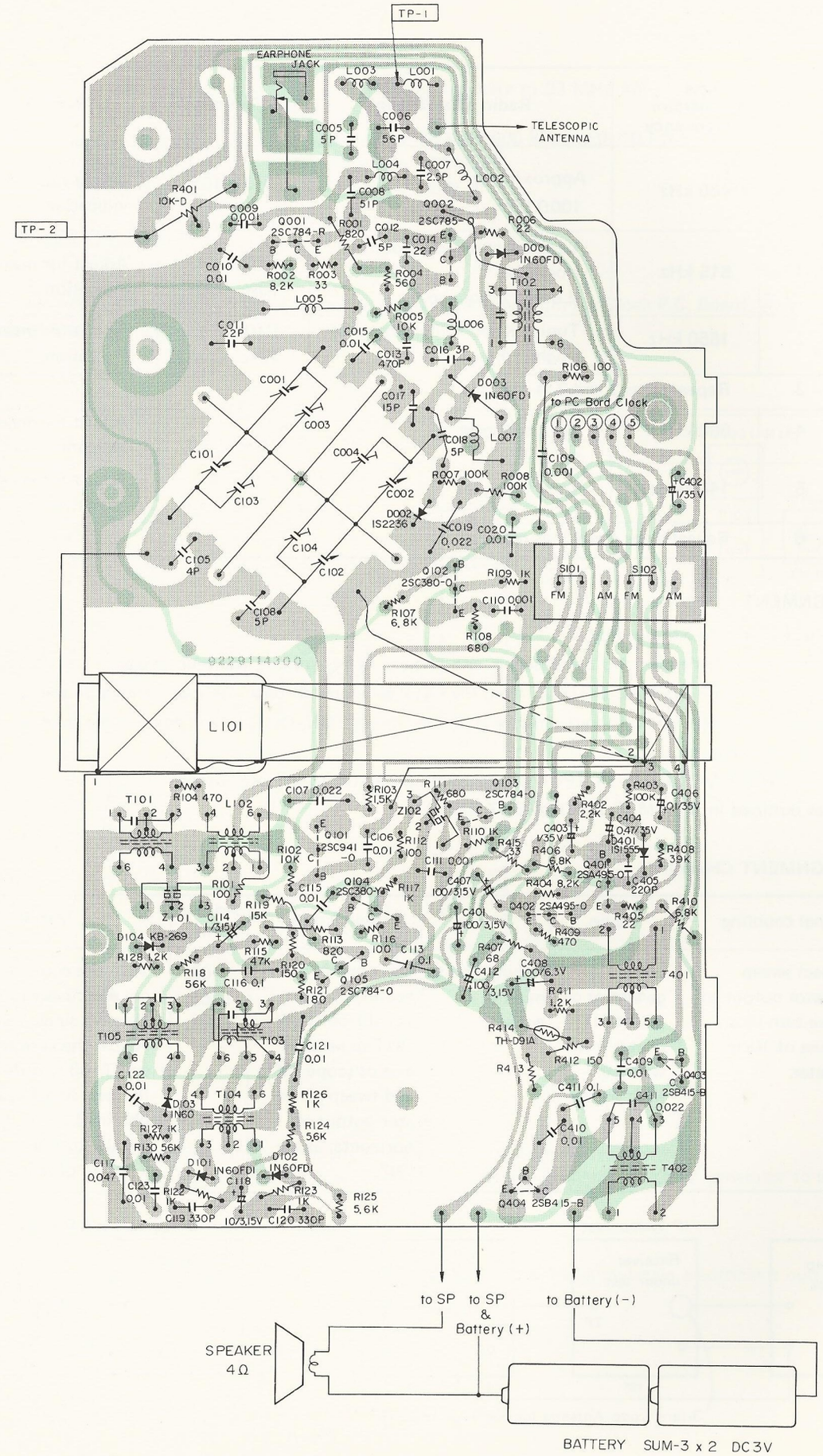
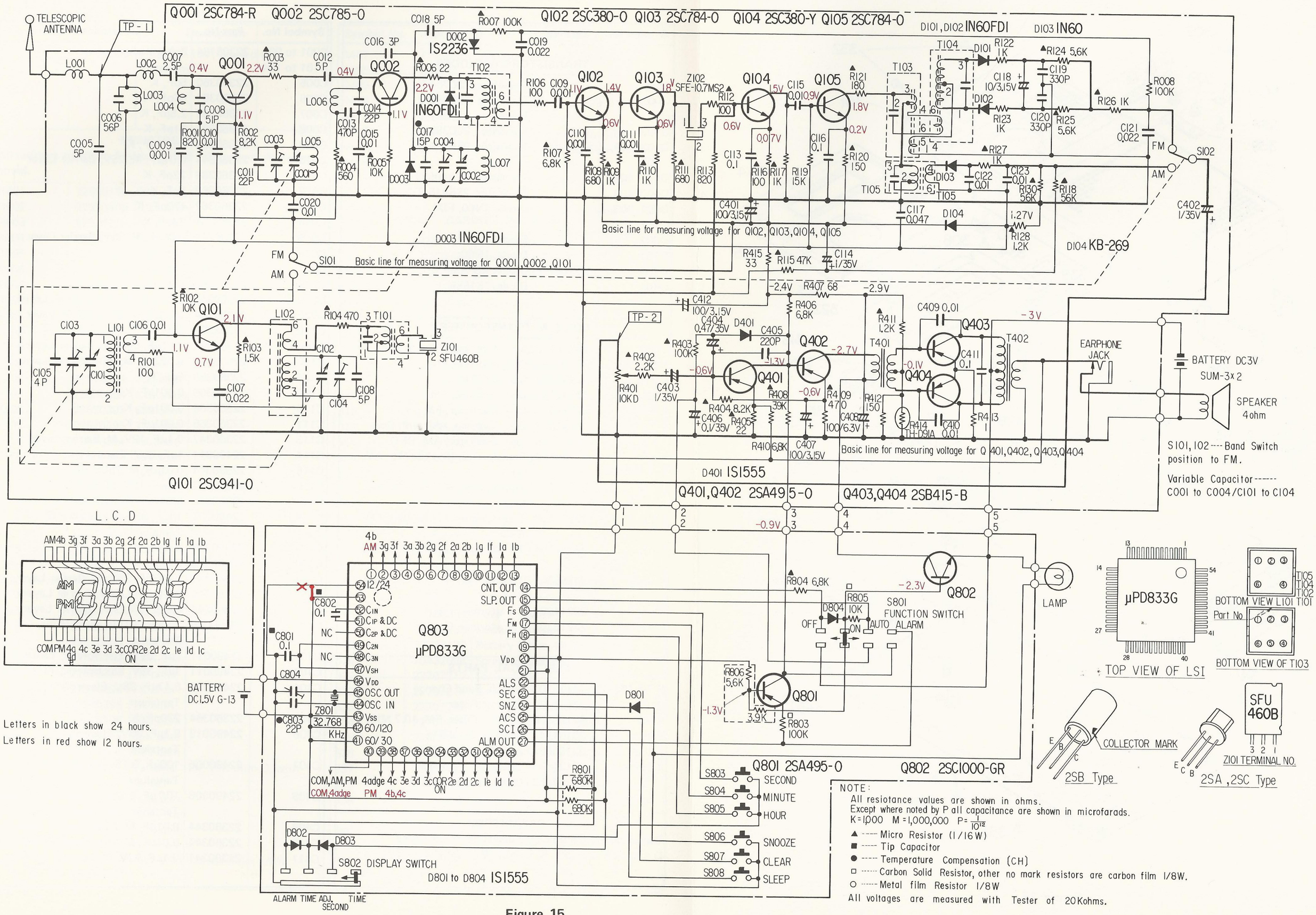


Figure 14.

SCHEMATIC DIAGRAM



NOTE:
All resiotance values are shown in ohms.
Except where noted by P all capacitance are shown in microfarads.
K=1,000 M=1,000,000 P=$\frac{1}{10^{12}}$
▲ ---- Micro Resistor (1/16W)
■ ---- Tip Capacitor
● ---- Temperature Compensation (CH)
□ ---- Carbon Solid Resistor, other no mark resistors are carbon film 1/8W.
○ ---- Metal film Resistor 1/8W
All voltages are measured with Tester of 20Kohms.

Figure 15.

EXPLODED VIEW

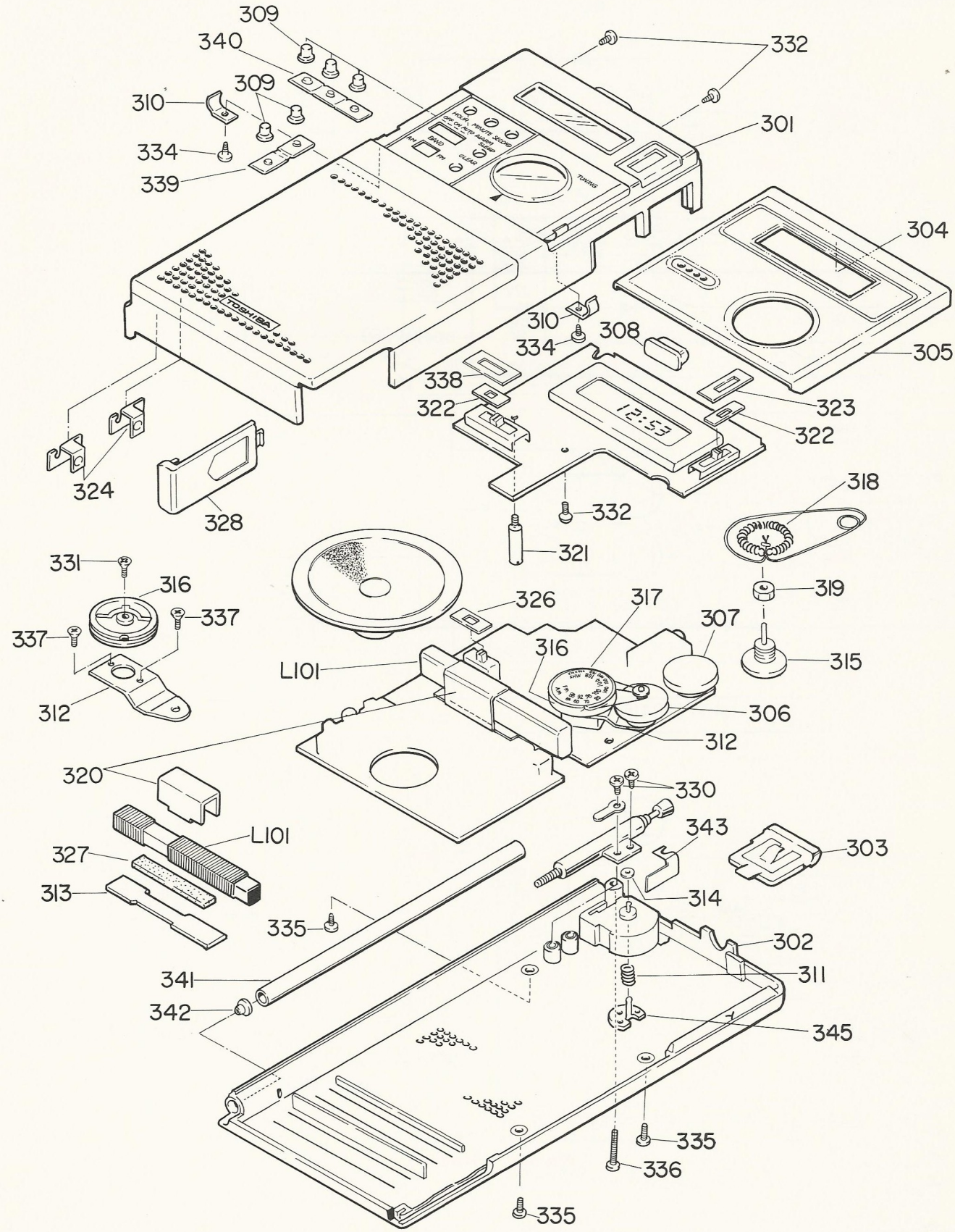


Figure 16.

PARTS LIST

Symbol No.	Part No.	Description
TRANSISTORS & DIODES		
Q001		Transistor, 2SC784-R
Q002		Transistor, 2SC785-O
Q101		Transistor, 2SC941-O
Q102		Transistor, 2SC380-O
Q103, 104, 105		Transistor, 2SC784-O
Q401, 402		Transistor, 2SA495-O
Q403, 404		Transistor, 2SB415-B
D001, 003, 101, 102		Diode, 1N60, FD1
D002		Diode, 1S2236
D103		Diode, 1N60
D104	22692017	Diode, KB-269
D401		Diode, 1S1555
COILS & TRANSFORMERS		
L002	22292112	Coil, Antenna, FM with Core
L003, 004	22294230	Coil, Antenna, FM
L005	22294362	Coil, RF, FM
L006, 001	22292077	Coil, Antenna, FM
L007	22294016	Coil, Oscillator, FM
L101	22242691	Coil, Antenna, AM, with Core
L102	22245236	Coil, Oscillator, AM, RED
T101	22264749	Transformer, IF, IT64749, AM, WHT
T102	22265766	Transformer, IF, IT65766, FM, VLT
T103	22267353	Transformer, IF, IT67353, FM, RED
T104	22267354	Transformer, IF, IT67354, FM, BLU
T105	22266343	Transformer, IF, IT66343, AM, BLK
T401	22214324	Transformer, Input
T402	22216307	Transformer, Output
ELECTRICAL PARTS		
S101-102	22195107	Switch, Band Change
Z101	22153083	Ceramic Filter
Z102	22153058	Ceramic Filter, FM, 10.7 MHz
W401	22151741	Speaker, SP-05S1E
J401	22163682	Jack, Earphone, 3.5ø
A001	22124474	Telescopic Antenna
	22104453	Clock Ass'y, 24H

CAPACITORS

Capacitors are Ceramic 50V unless otherwise noted.

D = ±0.5pF J = ±5% K = ±10% M = ±20% Z = $^{+80}_{-20}$%

Symbol No.	Part No.	Description
C001 to 004 C101 to 104	22308164	Poly-variable
C005	22360360	5pF, K
C006	22360351	56pF, K
C007	22360382	2.5pF, K
C008	22360381	51pF, K
C009	22360366	0.001μF, K
C010	22360344	0.01μF, M, 25V, Barrier Layer
C011	22360356	22pF, K
C012	22360360	5pF, K
C013	22360362	470pF, K
C014	22360356	22pF, K
C015	22360344	0.01μF, M, 25V, Barrier Layer
C016	22360361	3pF, K
C017	22360383	15pF, K
C018	22360360	5pF, K
C019	22360345	0.022μF, M, 25V, Barrier Layer
C020	22306344	0.01μF, M, 25V, Barrier Layer
C105	22306371	4pF, K
C106	22360344	0.01μF, M, 25V, Barrier Layer
C107	22306345	0.022μF, M, 25V, Barrier Layer
C108	22360360	5pF, K
C109	22360366	0.001μF, K
C110	22360366	0.001μF, K
C111	22360366	0.001μF, K
C113	22360347	0.1μF, 12V, M, Barrier Layer
C114	22490011	1μF, 35V, Electrolytic, Tantalum
C115	22360344	0.01μF, M, 25V, Barrier Layer
C116	22360347	0.1μF, 12V, M, Barrier Layer
C117	22360346	0.047μF, M, 12V, Barrier Layer
C118	22490002	10μF, 3.15V, Electrolytic, Tantalum
C119	22360363	330pF, K
C120	22360363	330pF, K
C121	22360345	0.022μF, 25V, M, Barrier Layer
C122	22360344	0.01μF, M, 25V, Barrier Layer
C123	22360344	0.01μF, M, 25V, Barrier Layer
C401	22490005	100μF, 3.15V, Electrolytic, Tantalum
C402	22490011	1μF, 35V, Electrolytic, Tantalum
C403	22490011	1μF, 35V, Electrolytic, Tantalum
C404	22490013	0.47μF, 35V, Electrolytic, Tantalum
C405	22360364	220pF, K
C406	22490012	0.1μF, 35V, Electrolytic, Tantalum
C407	22490005	100μF, 3.15V, Electrolytic, Tantalum
C408	22490008	100μF, 6.3V, Electrolytic, Tantalum
C409	22360344	0.01μF, M, 25V, Barrier Layer
C410	22360344	0.01μF, M, 25V, Barrier Layer
C411	22360347	0.1μF, 12V, M, Barrier Layer

Symbol No.	Part No.	Description
C412	22490005	100μF, 3.15V, Electrolytic, Tantalum
RESISTORS		
All resistors are Micro Resistor 1/16W ±5% unless otherwise noted.		
R001	22550180	820 ohm, Carbon Film 1/8W
R002	22570405	8.2K ohm
R003	22570376	33 ohm
R004	22570391	560 ohm
R005	22570406	10K ohm
R006	22570374	22 ohm
R007	22570418	100K ohm
R008	22550204	100K ohm, Carbon Film 1/8W
R101	22540162	100 ohm, Carbon Film 1/8W
R102	22570406	10K ohm
R103	22570396	1.5K ohm
R104	22570390	470 ohm
R106	22570382	100 ohm
R107	22570404	6.8K ohm
R108	22570392	680 ohm
R109	22570394	1K ohm
R110	22570394	1K ohm
R111	22570392	680 ohm
R112	22570382	100 ohm
R113	22550185	2.2K ohm, Carbon Film 1/8W
R115	22570414	47K ohm
R116	22570382	100 ohm
R117	22570394	1K ohm
R118	22570415	56K ohm
R119	22550163	33 ohm, Carbon Film 1/8W
R120	22570388	330 ohm
R121	22570385	180 ohm
R122	22550181	1K ohm, Carbon Film 1/8W
R123	22550181	1K ohm, Carbon Film 1/8W
R124	22570403	5.6K ohm
R125	22570403	5.6K ohm
R126	22570394	1K ohm
R127	22570394	1K ohm
R128	22570395	1K ohm
R129	22570406	10K ohm
R130	22570415	56K ohm
R131	22570406	10K ohm
R401	22613031	Variable, 12ϕ, 10K ohm-D, with Switch
R402	22570398	2.2K ohm
R403	22570418	100K ohm
R404	22570405	8.2K ohm
R405	22570374	22 ohm
R406	22550191	6.8K ohm, Carbon Film 1/8W

Symbol No.	Part No.	Description
R407	22550167	68 ohm, Carbon Film 1/8W
R408	22570413	39K ohm
R409	22570390	470 ohm
R410	22550191	6.8K ohm, Carbon Film 1/8W
R411	22570395	1.2K ohm
R412	22550171	150 ohm, Carbon Film 1/8W
R413	22570431	1 ohm, Metal Oxide Film 1/8W
R414		Thermistor, D91A
R415	22550185	2.2K ohm, Carbon Film 1/8W
CABINET PARTS		
301	22811080	Cabinet Front Ass'y
302	22832486	Cabinet Back
303	22822131	Battery Cover Ass'y for Clock
304	22902040	Label
305	22842169	Cover Ass'y, Control
306	22824246	Knob, Tune
307	22826212	Knob, Volume
308	22824247	Button, Snooz
309	22824248	Button, Clock
310	22774550	Plate Spring, Lock
311	25772459	Spring, Battery
312	22755107	Support, Tune
313	22758070	Sheet, Antenna
314	22703246	Hold Washer
315	22743224	Tuning Shaft
316	22742202	Dial Drum
317	22847350	Dial Plate
318	25771910	Spring, Drum
319	22702150	Nut 4¢
320	22757087	Holder, Antenna
321	22753025	Stud
322	22758064	Cover A, Switch
323	22758065	Cover B, Switch
324	22725171	Battery Contact A
326	22758067	Cover C, Switch
327	22751160	Cushion, Battery
328	22822130	Battery Cover Ass'y
330	70432004	Screw, BID2ϕ x 4mm
331	22707217	Screw, BID1.7ϕ x 2.5mm
332	22707214	Screw, BID2ϕ x 3mm, BLK
333	22707216	Screw, BID2ϕ x 1.8mm
334	22707215	Screw, BID1.7ϕ x 1.8mm
335	22707261	Screw, OVL 2ϕ x 8mm, BLK
336	22707262	Screw, OVL 2ϕ x 16mm, BLK
337	22707257	Screw, FLT1.7ϕ x 2mm, BLK
338	22758088	Switch Cover D, Function Switch
339	22751146	Rubber Button, 2 Gang, Electric Conduction
340	22751147	Rubber Button, 3 Gang, Electric Conduction
341	22875037	Bobbin, Antenna, BLK

Symbol No.	Part No.	Description
342	22833340	Stopper, Bobbin
343	22725174	Contact D
345	22725175	Contact E
		ACCESSORIES
	22902011	Owner's Manual
	22991064	Carrying Case
	22154025	Earphone, 3.5ϕ
		CLOCK PARTS
Q801		Transistor, 2SA495-O
Q802		Transistor, 2SC1000-GR
D801, 802, 803, 804		Diode, 1S1555
R801	22134121	Composite Part, Resistor
R803	22560214	Solid Resistor, 100K ohm
R804	22570404	Micro Resistor, 6.8K ohm
R805	22560212	Solid Resistor, 10K ohm
R806	22134120	Composite Part, Resistor
Z801	22153072	Crystal
S801, 802	22195110	Micro Switch
N801	22113443	Lamp, 3V 35mA
350	22104395	Liquid Crystal Display
351	22723135	Insulator, LCD
352	22751143	Rubber Contact
353	22830091	Insulator, Snooze
354	22755106	Holder, LCD
355	25774549	Snooze Contact
356	22161549	Connecting Wire

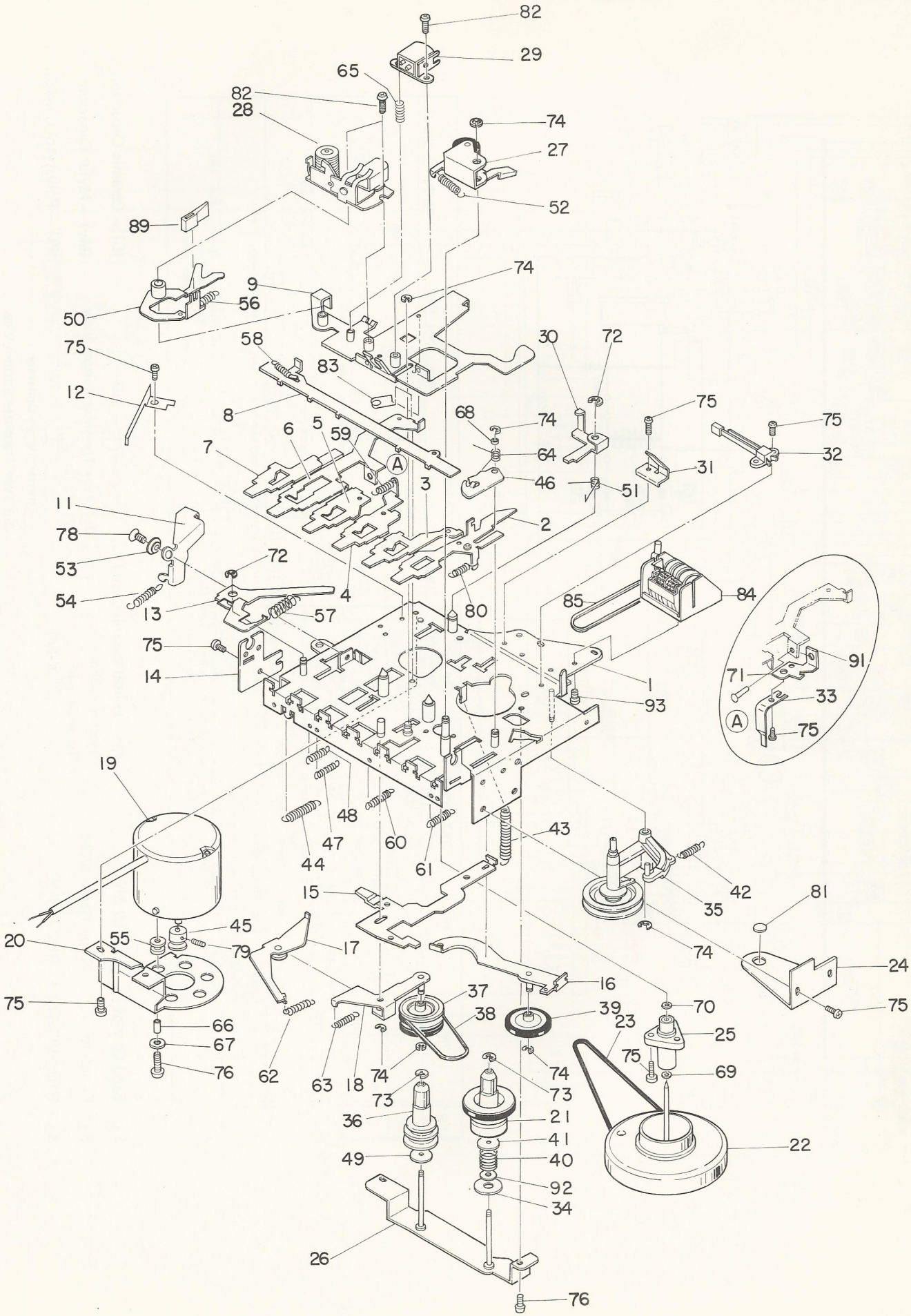


Figure 17. Exploded View-Mechanism

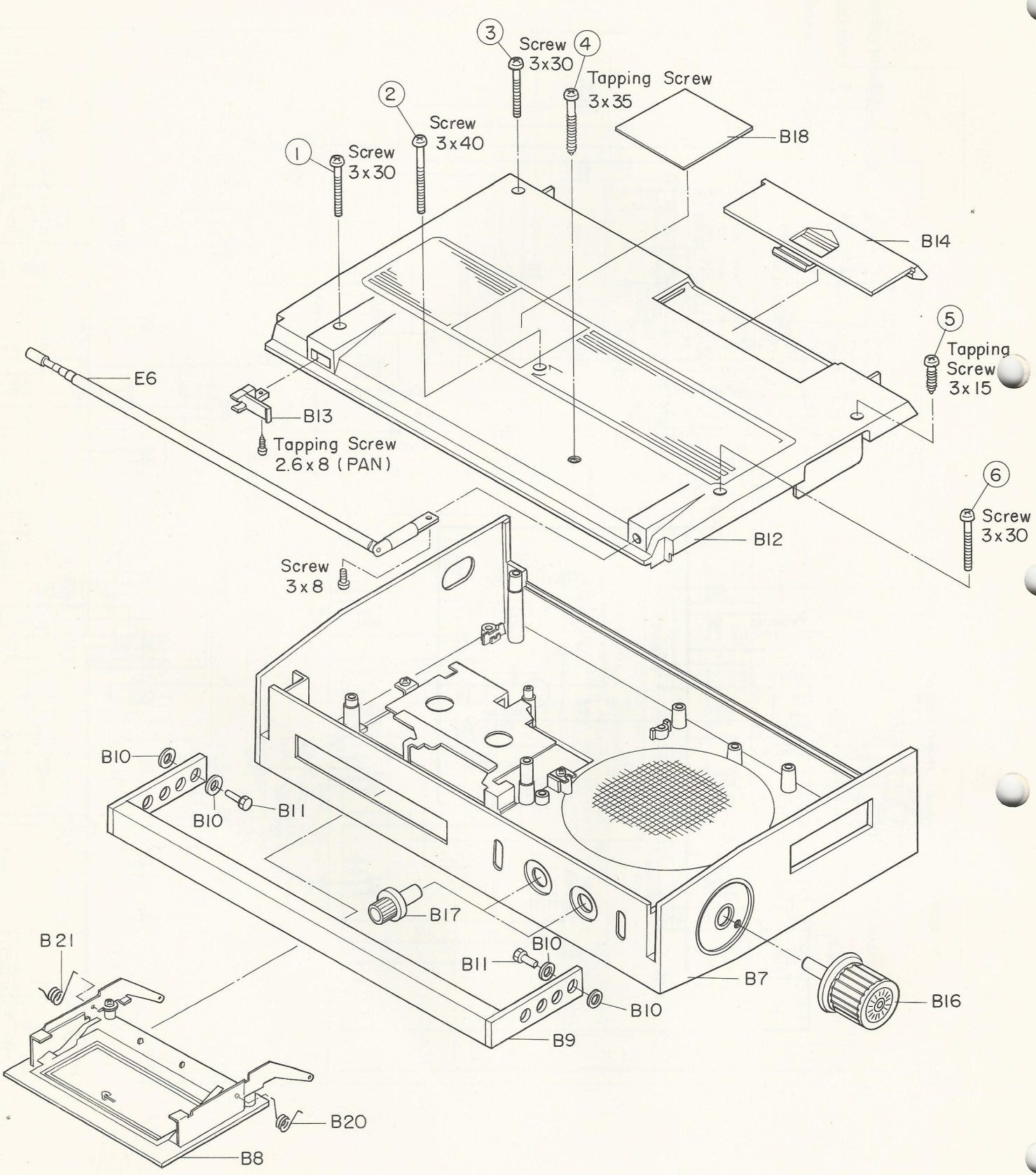


Figure 18. Exploded View-Cabinet

PARTS LISTS

Symbol No.	Part No.	Description
TRANSISTORS, DIODES & IC		
TR1		Transistor, 2SC784-0
TR2, 3		Transistor, 2SC785-R/0
TR4, 5		Transistor, 2SC380A-0
TR6		Transistor, 2SC1000-GR
TR7		Transistor, 2SC732-BL
TR8		Transistor, 2SC373
TR9		Transistor, 2SC372-0/Y
TR10		Transistor, 2SC1000-GR
TR11		Transistor, 2SC733-GR/BL
TR12, 13		Transistor, 2SC1173-0/Y
TR14		Transistor, 2SC733-GR/BL
TR15		Transistor, 2SB56-A
TR16		Transistor, 2SC735-0
IC1		IC, TA-7119P
D1		Diode, 1S1555
D2		Diode, 1S2236
D3	22115201	Diode, 0A90
D4		Diode, 1S1555
D5		Diode, 1N60
D6, 7		Diode, 1N60, FD1
D8, 9		Diode, M8513
D101		Diode, 1N60
D102		Diode, 1N60
D103		Diode, 1N60
D104		Diode, 1S1555
D105		Diode, 1B2C1
COILS & TRANSORMERS		
L101	22294068	Coil, RF, FM, LH-8030
L102	22294016	Coil, RF, FM, LH-8404R
L103	22294117	Coil, RF, FM, LH-8002
L104	22294022	Coil, RF, FM, LH-8403L
L105	22291058	Coil, Choke, FM, LH-09A
L106	22291066	Coil, Choke, FM, LH-09-1066
L107	22282131	Coil, RF, LH-5081
L108	22242530	Coil, Antenna, with Ferrite
L109	22245169	Coil, Oscillator, LH-7275, MW
L110	22285197	Coil, RF, 73D5197, SW
L111	22265489	Transformer, IF, IT-07327
L112	22264635	Transformer, IF, IT-07485
L113	22266310	Transformer, IF, IT-07484
L114	22294054	Coil, FM, LH-9052
L115	22241026	Coil, Antenna, LH-621J-026
L201	22235148	Coil, Oscillator, Tape
L202	22291003	Coil, Choke, LH-400
L203	22214292	Transformer, DT-11906
L204	22216266	Transformer, Output
L205	22211159	Coil, Choke, LF
L301	22291012	Coil Choke, RF, LH-9043A
L302	22213907	Transformer, Power

Symbol No.	Part No.	Description
ELECTRICAL PARTS		
E1	22163450	Jack, AC
E2	22104203	Level Meter
S4	22145985	Switch, Leaf
E5	22151605	Speaker, 10F4B
E6	22124457	Telescopic Antenna
E7	22154134	Microphone Unit
E8	22133509	IF Block
E9	22163405	Jack Assembly
CR1	22134080	Composite Parts
CR2	22134033	Composite Parts, CRF-42
CF1, 2, 3	22153037	Ceramic Filter, KMFC-21
S1	22146672	Switch, Slide, FM, SW, MW Change
S2	22146602	Switch, Slide, Function
S3	22146590	Switch, Slide, Record/Playback
CAPCITORS		
D= ±0.5PF, J= ±5%, K= ±10%, M= ±20%, Z= -20+80%, P= -0+100%		
C1, 2, 3, 4, 5	22308113	Variable
C6, 7	22309036	Trimmer
C101	22361209	Ceramic, 2PF, D
C102	22361100	Ceramic, 10PF, D
C103	22342223	Ceramic, 0.022 mfd, Z
C104	22342223	Ceramic, 0.022 mfd, Z
C105	22342223	Ceramic, 0.022 mfd, Z
C106	22342223	Ceramic, 0.022 mfd, Z
C107	22361220	Ceramic, 22PF, D
C108	22361709	Ceramic, 7PF, D
C109	22382331	Polystyrol, 330PF, K
C110	22361150	Cramic, 15PF, J
C111	22361509	Ceramic, 5PF, D
C112	22361100	Ceramic, 10PF, D
C113	22361220	Ceramic, 22PF, D
C114	22342223	Ceramic, 0.022 mfd, Z
C115	22361220	Ceramic, 22PF, D
C116	22342223	Ceramic, 0.022 mfd, Z
C117	22361309	Ceramic, 3PF, D
C118	22342473	Ceramic, 0.047 mfd, Z
C119	22342473	Ceramic, 0.047 mfd, Z
C120	22342223	Ceramic, 0.022 mfd, Z
C121	22342223	Ceramic, 0.022 mfd, Z
C122	22373103	Mylar, 0.01 mfd, M
C123	22373103	Mylar, 0.01 mfd, M
C124	22373333	Mylar, 0.033 mfd, M
C126	22342103	Ceramic, 0.01 mfd, Z
C127	22373103	Mylar, 0.01 mfd, M

Symbol No.	Part No.	Description
C128	22373222	Mylar, 0.0022 mfd, M
C129	22361100	Ceramic, 10PF, D
C130	22382301	Polystyrol, 300PF, K
C131	22361100	Ceramic, 10PF, D
C132	22382182	Polystyrol, 1800PF, K
C133	22362220	Ceramic, 22PF, K
C134	22342223	Ceramic, 0.022 mfd, Z
C135	22342223	Ceramic, 0.022 mfd, Z
C136	22342223	Ceramic, 0.022 mfd, Z
C137	22373333	Mylar, 0.033 mfd, M
C138	22342223	Ceramic, 0.022 mfd, Z
C201	22448478	Electrolytic, 0.47 mfd, 50V
C202	22373333	Mylar, 0.033 mfd, M
C203	22447339	Electrolytic, 3.3 mfd, 35V
C204	22443330	Electrolytic, 33 mfd, 10V
C205	22373152	Mylar, 1500PF, M
C206	22443101	Electrolytic, 100 mfd, 10V
C207	22382331	Polystyrol, 330PF, K
C208	22448478	Electrolytic, 0.47 mfd, 50V
C209	22448478	Electrolytic, 0.47 mfd, 50V
C210	22443101	Electrolytic, 100 mfd, 10V
C211	22340002	Ceramic, 0.1 mfd, Z
C212	22382101	Polystyrol, 100PF, K
C213	22445100	Electrolytic, 10 mfd, 16V
C214	22443101	Electrolytic, 100 mfd, 10V
C215	22340004	Ceramic, 0.5 mfd, Z
C216	22443479	Electrolytic, 3.3 mfd, 35V
C217	22443379	Electrolytic, 3.3 mfd, 35V
C218	22373104	Mylar, 0.1 mfd, M
C219	22446479	Electrolytic, 4.7 mfd, 25V
C220	22448478	Electrolytic, 0.47 mfd, 50V
C221	22443221	Electrolytic, 220 mfd, 10V
C222	22443221	Electrolytic, 220 mfd, 10V
C223	22373103	Mylar, 0.01 mfd, M
C224	22373473	Mylar, 0.047 mfd, M
C225	22373104	Mylar, 0.1 mfd, M
C226	22447339	Electrolytic, 3.3 mfd, 35V
C227	22343222	Ceramic, 0.0022 mfd, M
C228	22443101	Electrolytic, 100 mfd, 10V
C229	22443221	Electrolytic, 220 mfd, 10V
C230	22373333	Mylar, 0.033 mfd, M
C231	22373333	Mylar, 0.033 mfd, M
C232	22343102	Ceramic, 0.001 mfd, M
C233	22442331	Electrolytic, 330 mfd, 6.3V
C234	22382222	Polystyrol, 2200PF, K
C235	22373472	Mylar, 0.0047 mfd, M
C236	22373223	Mylar, 0.022 mfd, M
C237	22443330	Electrolytic, 33 mfd, 10V
C238	22443221	Electrolytic, 220 mfd, 10V
C239	22453102	Electrolytic, 1000 mfd, 10V
C240	22342223	Ceramic, 0.022 mfd, Z
C241	22342223	Ceramic, 0.022 mfd, Z
C242	22373153	Mylar, 0.015 mfd, M
C243	22447339	Electrolytic, 3.3 mfd, 35V
C244	22342223	Ceramic, 0.022 mfd, Z

Symbol No.	Part No.	Description
C245	22343271	Ceramic, 270PF, M
C246	22342103	Ceramic, 0.01 mfd, Z
C247	22373103	Mylar, 0.01 mfd, M
C248	22342223	Ceramic, 0.022 mfd, Z
C301	22342223	Ceramic, 0.022 mfd, Z
C302	22443221	Electrolytic, 220 mfd, 10V
C401	22341103	Ceramic, 0.01 mfd, P
C402	22341103	Ceramic, 0.01 mfd, P
C403	22341103	Ceramic, 0.01 mfd, P
C404	22382201	Polystyrol, 200PF, K
C405	22341103	Ceramic, 0.001 mfd, P
C406	22341223	Ceramic, 0.022 mfd, P
C407	22373393	Ceramic, 0.039 mfd, M
C408	22362470	Ceramic, 47PF, K
C409	22305007	Film Mica, 200PF, K
C410	22445100	Electrolytic, 10 mfd, 16V
C411	22341103	Ceramic, 0.01 mfd, P
C412	22443101	Electrolytic, 100 mfd, 10V

RESISTORS

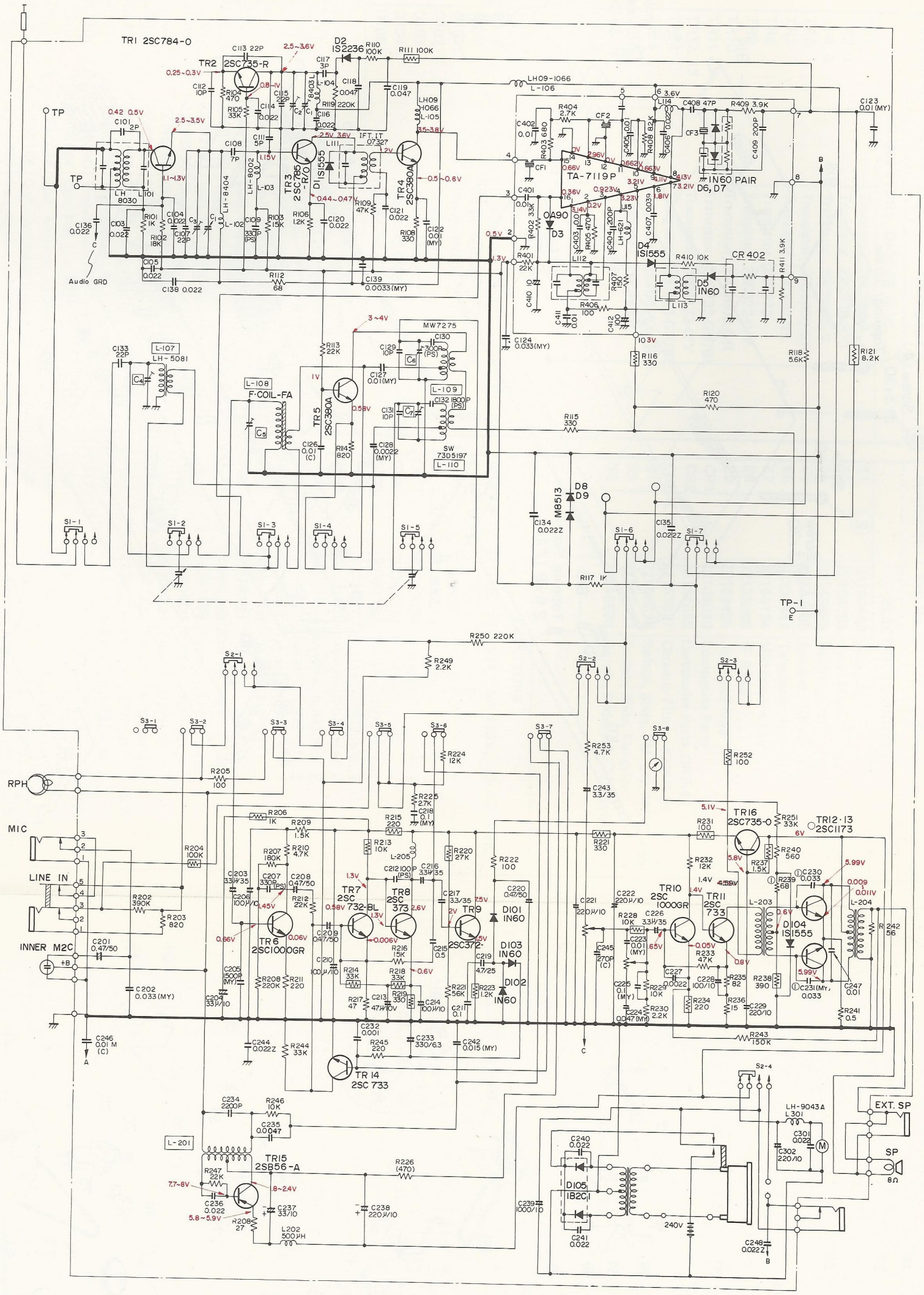
1. **Resistors are 1/8W, ±10%, unless otherwise noted.**
2. **PRC is printed resistor circuit. To replace one, please use the following substitutional fixed carbon film resistor 1/8W, 10%.**

R101	22554102	1K ohm
R102	22554183	18K ohm
R103	22554153	15K ohm
R104	22554471	470 ohm
R105	22554333	33K ohm
R106	22554122	1.2K ohm
R107	22554472	4.7K ohm
R108	22554331	330 ohm
R110	22554104	100K ohm
R111 (PRC)	22544104	100K ohm
R112	22554680	68 ohm
R113	22554223	22K ohm
R114	22554821	820 ohm
R115	22554331	330 ohm
R116 (PRC)	22544331	330 ohm
R117	22554102	1K ohm
R118	22554562	5.6K ohm
R119	22554224	220K ohm
R120	22554471	470 ohm
R121 (PRC)	22544822	8.2K ohm
R202	22554394	390K ohm
R203	22554821	820 ohm
R204 (PRC)	22554153	100K ohm
R205	22544101	100 ohm
R206 (PRC)	22544101	1K ohm
R207	22554184	180K ohm
R208	22554224	220K ohm
R209	22554152	1.5K ohm
R210	22554472	4.7K ohm
R211	22554221	220 ohm

Symbol No.	Part No.	Description
R212	22554223	22K ohm
R213 (PRC)	22544103	10K ohm
R214 (PRC)	22544333	33K ohm
R215 (PRC)	22544221	220 ohm
R216	22554153	15K ohm
R217	22554470	47 ohm
R218 (PRC)	22544333	33K ohm
R219 (PRC)	22544331	330 ohm
R220 (PRC)	22544273	27K ohm
R221	22554563	56K ohm
R222	22554101	100 ohm
R223 (PRC)	22544122	1.2K ohm
R224	22554123	12K ohm
R225	22554272	2.7K ohm
R226	22554471	470 ohm
R227 (PRC)	22544331	330 ohm
R228 (PRC)	22544103	10K ohm
R229	22554103	10K ohm
R230	22554222	2.2K ohm
R231 (PRC)	22544101	100 ohm
R232	22554123	12K ohm
R233	22554473	47K ohm
R234 (PRC)	22544221	220 ohm
R235	22554820	82 ohm
R236	22554150	15 ohm
R237 (PRC)	22544152	1.5K ohm
R238 (PRC)	22544391	390 ohm
R239 (PRC)	22544680	68 ohm
R240	22554561	560 ohm
R241	22554508	0.5 ohm
R242	22554560	56 ohm
R243	22554154	150K ohm
R244	22554333	33K ohm
R245	22554221	220 ohm
R246	22554103	10K ohm
R247	22554223	22K ohm
R248	22554330	33 ohm
R249	22554222	2.2K ohm
R250	22554224	220K ohm
R251	22554333	33K ohm
R252 (PRC)	22554101	100 ohm
R253	22554472	4.7K ohm
VR1	22636400	Variable, 50K ohm, D, 16
VR2	22635401	Variable, 50K ohm, B, 16
R401	22554223	22K ohm
R402	22554332	3.3K ohm
R403	22554681	680 ohm
R404	22554372	2.7K ohm
R405	22554471	470 ohm
R406	22554101	100 ohm
R407	22554151	150 ohm
R408	22554822	8.2K ohm
R409	22554392	3.9K ohm
R410	22554103	10K ohm
R411	22554392	3.9K ohm

Symbol No.	Part No.	Description
	MECHANICAL PARTS	
M1	22764018	Spring, Battery
M2	25830115	Ribbon
M3	25839186	Plate, Battery
M4	22741174	Pointer
M5	22742077	Dial Pulley
M6	22999222	Dial Cord, 0.5 DIA.
M7	22749113	Tuning Shaft
M8	22752232	Spacer
M9	25761271	Rubber, Meter, Left
M10	25771548	Spring, Dial Pulley
M11	25816329	Lever, Switch Assembly
M12	22721196	Holder, Antenna
M13	25816360	Band Lever Assembly
M14	25827127	Dial Plate
	CABINET PARTS	
B1	25854205	Cap, Switch
B2	25854216	Cap, Switch
B3	25816364	Push Button Assembly, Ivory
B4	25816365	Push Button Assembly, Blue
B5	25816366	Push Button Assembly, Red
B6	25854201	Cover, AC Jack
B7	25811437	Cabinet Front Assembly
B8	25812464	Cassette Cover Assembly
B9	25815155	Handle Assembly
B10	25835239	Spacer Handle
B11	25835244	Shaft, Handle
B12	25811396	Cabinet Back Assembly
B13	22875026	Clamp, Antenna
B14	25811349	Battery Cover Assembly
B15	25854239	Cover, Jack
B16	25826466	Knob, Tuning
B17	25826474	Knob, Volume
B18	25827229	Nameplate, Main
B19	25833279	Cover, Knob
	ACCESSORIES	
	22105323	Cassette Tape, C-30
	22176483	Power Cord, E2ESSET
	22950270	Caution Label
	22954091	Owner's Manual
	22152025	Earphone, ER-1427C
	MECHANISM	
2	25710523	Assembly, Operation Plate, Pause
6, 33, 71	25718136	Assembly, Operation Plate, Record
12	25774223	Spring, ASO Lock
19, 45, 79	25711083	Motor Assembly
21	25712256	Hub Plate, Take-up
22	25717218	Flywheel and Capstan
23	25755247	Belt, Drive
25	25718135	Bearing, Capstan Shaft
27	25717219	Pressure Roller Assembly
28	25711009	Head Assembly, Erase

Symbol No.	Part No.	Description
29	22217158	Head, Record/Playback
34	25764246	Washer, Hub Plate, Take-up
35	25713343	Pulley, Take-up
36	25712272	Hub Plate, Supply
37	25713312	Pulley, Rewind
38	25755171	Belt, Rewind
39	25713281	Idler, Fast Forward
40	25772154	Spring, Hub Plate, Take-up
41	25764298	Washer, Hub Plate, Take-up
42, 43	25771609	Spring, Take-up Lever
44	25771603	Spring, Stop Operation Plate
46	25742576	Spring, Rewind Operation Plate
47	25771601	Spring, Rewind Operation Plate
48	25771404	Spring, Record Operation Plate
49	25764196	Washer, Hub Plate Supply
51	25773152	Spring, Record Lock
52	25771453	Spring, Pressure Roller
55	25761238	Cushion, Rubber, Motor
56	25771610	Spring, ASO Lever
57	25771414	Spring, ASO Drive
59	25771567	Spring, Rewind Lever B
60	25771601	Spring, Play Operation Plate
61	25771597	Spring, Fast Forward Operation Plate
62	25771578	Spring, Fast Forward Lever
64	25773161	Spring, Pause Lock
65	25772240	Spring, Head
66	25726235	Spacer, Motor
67	25735202	Washer, Motor
69	25764398	Washer, Flywheel
70	25764396	Washer, Capstan Shaft
73	25735159	Retaining Ring, 1.5 Dia.
78	22701361	Screw, 2.6+5
80	25771408	Spring, Pause Operation
81	25764301	Sheet, Nylon
83	25773214	Spring, Torsion
84	25873143	Counter
85	25755226	Belt, Counter
89	25764351	Cap, ASO
90	25771572	Spring, Play Slider
91	25771600	Spring, Play Slider
92	25764394	Washer, Nylon
96	25771544	Spring, Rewind Pulley



TR	TR1	TR2	TR3 TR5 TR15 TR6	TR4 TR7 TR14 TR8	TR9	TA7119P	TR10 TR11 TR16	TR12, TR13
D			D1, D2		D3 D8, D9 D101, D103, D102, D105	D4	D6 D7 D5	D104
L	L101	L107	L102 L103 L108 L201	L104 L111 L202 L105 L109 L110 L205	L106	L112 L115 L114 L302 L113		L203 L301 L204
C	C136 C103 C4 C101 C133 C105	C104 C107 C112 C113 C114 C138 C3 C1 C5 C111 C108 C109	C115 C1 C120 C2 C116 C118 C117 C126	C121 C127 C122 C132 C128 C119 C6 C7 C129 C131 C130	C124 C410 C411 C402 C134 C403 C401	C404 C405 C407 C406 C408 C412 C135	C409	C123
		C246 C201 C202	C204 C205 C203 C207 C208 C209 C234 C232 C216 C236 C244 C235 C237	C212 C213 C215 C214 C233 C242 C238 C218 C216 C217 C219	C220 C240 C241 C239	C221 C243 C245 C224	C227 C226 C228	C229 C248 C301 C230 C247 C302 C231
R	R101	R102	R104 R105 R103 R112 R106 R119 R114 R110 R113	R111 R108	R401 R403 R402	R115 R405 R407 R408 R410 R404 R116 R406 R117	R409 R120 R409 R411	R118 R121
		R202	R203 R204 R247 R205	R248 R208 R244 R206 R246 R209 R207 R211 R210 R212	R214 R217 R245 R216 R213 R218 R225 R226 R249 R250 R223 R219 R215 R224 R220 R221	R222 R253 R221 R228 R229 R230	R233 R235 R234 R236 R231 R232	R243 R240 R237 R239 R252 R238 R241 R242

S_1 : Band Change FM:SW:MW

S_2 : Function Tape:Radio:Sleep

S_3 : Record/Playback REC:PLAY

Printed Resistor Circuit

Resistor — Ohm

Capacitor — μF

(P=PF)

Collector
Emitter — Base
2SC Type Transistor Bottom View

Base
Emitter — Collector
2SB Type Transistor Bottom View

(C) — Ceramic Capacitor

(My) — Mylar Capacitor

(Ps) — Polystyrol Capacitor

Figure 16. Schematic Diagram