

## PARTS LIST

Symbol No.	Stock No.	Description
<b>TRANSISTORS, THERMISTORS AND DIODES</b>		
TR1, 101	3122944000	2SB440, 1st Audio Amp.
TR2, 3, 4	3122065400	2SB54, 2nd, 3rd and 4th Audio Amp.
TR2, 103		
TR5, 105	3122005900	2SB56, Audio Driver
TR5, 7, 106	3122046522	2SB463, Audio Output and Bias Oscillator
TR5, 107, 208		
U1, 101	2269100200	D91A, Temperature Compensator
CD1, 101	3112066900	1N50, Level Meter Rectifier
CD201, 202	3112319400	1N3194, Power Rectifier
<b>ELECTRICAL PARTS</b>		
T1, 101	2521410200	Transformer, Audio Input
T2, 102	2521610500	Transformer, Audio Output
T3	2523511200	Coil, Bias Oscillator
T201	2521313900	Transformer, Power (110, 120, 200, 220, 230, 240Volts)
T201	2521314100	Transformer, Power (120Volts)
PL201	2511310100	NE-2C, Power Indication
J1, 3, 101	2516315400	Jack, 3.5mm, MIC, EXT SP
J2, 102, 301	2516310300	Jack, 3.5mm, LINE IN.
J202		Speaker Box
J204	2516310600	Jack, DIN
J205	2516312600	Jack, 6.5mm, HEAD PHONE
M1, 101	2519411000	Meter, Record Level
F201	2514411700	Fuse, 1.2A
F202	2516510300	Fuse Holder
F202, 203	2516112900	Terminal Strip, 7P
F204, 205	2516110300	Terminal Strip, 3P
F206	2516111500	Terminal Strip, 2P
SP301, 302	2515110500	Dynamic Speaker, 3- $\frac{3}{4}$ " x 6", 8 ohm
L1, 101	2522910100	Coil, Bias Leak
L201	2522910100	Coil, Erase Head Dummy
<b>SWITCHES</b>		
S1, 101	2514510900	Slide, Record/Playback
S2, 102	2514512500	Leaf, Muting
S3, 103	2514513400	Leaf, Recording Compensation
S4, 104	2514517200	Seesaw, Speaker Monitor
S5, 105	2514517300	Slide, Channel Selector
S5	2514511200	Leaf, Bias OSC, Power
S7	2514515800	Seesaw, Power Supply
S8	2514512700	Leaf
<b>CAPACITORS</b>		
C1, 101	2544350900	Electrolytic, 5 mfd, 10 WV
C2, 3, 11, 12	2544230000	Electrolytic, 30 mfd, 6 WV
15, 16, 18		
102, 103		
111, 112		
115, 116		
118		
C4, 104	2545520100	Electrolytic, 200 mfd, 15 WV
C5, 105	2533747100	Film Mica, 470 pF, 500 WV
C6, 106	2546230000	Electrolytic, 30 mfd, 6 WV

Symbol No.	Stock No.	Description
C7, 9, 107	2544530900	Electrolytic, 3 mfd, 15 WV
109		
C8, 108	2537315300	Mylar, 0.015 mfd, 50 WV
C10, 110, 202	2545550100	Electrolytic, 500 mfd, 15 WV
C13, 113	2537310400	Mylar, 0.1 mfd, 50 WV
C17, 117	2537315400	Mylar, 0.15 mfd, 50 WV
C19, 119	2546010200	Electrolytic, 1,000 mfd, 15 WV
C20, 21,	2537310300	Mylar, 0.01 mfd, 50 WV
120, 121		
C22, 122	2537347300	Mylar, 0.047 mfd, 50 WV
C23, 24,	2533810100	Film Mica, 100 pF, 500 WV
123, 124		
C25, 125	2539213200	Trimmer, 10 to 150 pF, 500 WV
C26, 126	2539247100	Polyethylene, 470 pF, 500 WV
C27, 127	2537233200	Mylar, 0.0333 mfd, 50 WV
C201	2548620200	Electrolytic, 2,000 mfd, 35 WV
C203	2537333300	Mylar, 0.033 mfd, 50 WV
C204	2539010500	Polyethylene, 1,000 pF, 500 WV
<b>RESISTORS</b>		
All resistors are $\frac{1}{4}$ W, 10%, carbon film unless otherwise noted		
R1, 40, 101	2551268100	680 ohm
140		
R2, 11, 20,	2551233200	3.3K ohm
102, 111,		
120		
R3, 103	2551000300	240K ohm, $\frac{1}{4}$ W (Noiseless)
R4, 104	2551000700	47K ohm, $\frac{1}{4}$ W (Noiseless)
R5, 9, 10, 24	2551210300	10K ohm
33, 105,		
109, 110		
124, 133		
203		
R6, 106	2551212300	12K ohm
R7, 14, 25	2551210200	1K ohm
26, 30, 107		
114, 125		
126, 130		
R8, 108	2551262300	62K ohm
R12, 112	2551291100	910 ohm
R13, 35, 113	2551247200	4.7K ohm
135, 202		
R15, 115	2561011200	Semi-fixed Variable, 10K ohm
R16, 24, 116	2551251200	5.1K ohm
128		
R17, 117	2561011100	Semi-fixed Variable, 20K ohm
R18, 118	2551251300	51K ohm
R19, 23, 119	2551222300	22K ohm
123		
R21, 121	2551222200	2.2K ohm
R22, 122	2551239100	390 ohm
R27, 32, 127	2556347000	47 ohm, $\frac{1}{4}$ W, Carbon Composition
132		
R29, 129	2551220200	2K ohm
R31, 131	2551262100	620 ohm
R34	2556322000	22 ohm, $\frac{1}{4}$ W, Carbon Composition
R36, 136	2556382000	82 ohm, $\frac{1}{4}$ W, Carbon Composition
R37, 137	2568512100	3 ohm, 1W, Wire-wound



## TOSHIBA TAPE RECORDER

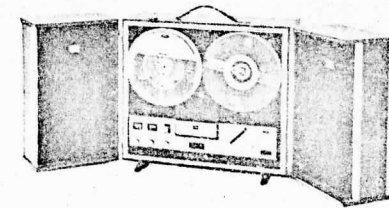
## SERVICE DATA

MODEL GT-840S

FILE NO. 014

## SPECIFICATIONS

Usable Tape Reel:	3", 5", 7"
Tape Speed:	7- $\frac{1}{2}$ and 3- $\frac{3}{4}$ ips (2 speeds)
Track:	$\frac{1}{2}$ track (2 channel)
Recording System:	A.C. bias at 55K Hz, 0.55mA
Erasing System:	A.C. erase 30mA
Level Indication:	Level meter
Frequency Response:	70 to 12,500 Hz at 7- $\frac{1}{2}$ ips (13dB) 70 to 8,000 Hz at 3- $\frac{3}{4}$ ips (15dB)
Power Output:	1.5 watts at 5% distortion (maximum 2.5 watts)
Input:	MIC., 10K ohm, 0.31mV LINE IN, 1M ohm, 100mV Amp. in, 100K ohm, 8mV EXT. SP., 8 ohm HEAD PHONE, 50 ohm Amp. out, 10K ohm
Output:	
Speaker:	Dynamic, 3- $\frac{3}{4}$ " x 6", impedance 8 ohm
Power Consumption:	50 watts
Signal/Noise Ratio:	40 dB minimum
Microphone:	Dynamic, nominal impedance 10K ohm
Erasure:	60 dB minimum at 1,000 Hz
Crosstalk:	40 dB minimum at 1,000 Hz
Hum Level:	50mV maximum
Wow/Flutter:	0.25% R. M. S. maximum at 7- $\frac{1}{2}$ ips 0.35% R. M. S. maximum at 3- $\frac{3}{4}$ ips
Rewind Time:	180 seconds maximum (1,214 feet tape on 7" reel)
Fast Forward Time:	240 seconds maximum
Tape Speed Accuracy:	Within $\pm 2\%$ at 7- $\frac{1}{2}$ ips Within $\pm 3\%$ at 3- $\frac{3}{4}$ ips
Dimensions:	16- $\frac{1}{8}$ " (W) x 10" (D) x 14- $\frac{3}{8}$ " (H)
Weight:	28 lbs



TOKYO SHIBAURA ELECTRIC CO., LTD.

2, GINZA, NISHI, 5-CHOME, CHUO-KU, TOKYO, JAPAN

## TECHNICAL POINTS

The GT-840S is a stereo tape recorder which is fully transistorized with 15 high-performance transistors.

### 4-TRACK 2-CHANNEL STEREO SYSTEM

Two tracks are available for one way, and four tracks are available for both ways. This tape recorder can be used for monaural 4-track operation as well as stereo record/playback operation.

### SPEAKER MONITOR SYSTEM

By turning on the speaker monitor switch (S4 and S104) while recording is being made, the sound being recorded can be monitored by means of the built-in speakers. Note, however, that the speaker monitor switch must be turned off in recording with the microphones, in order to prevent howling which could be produced if the microphones are placed close to the speakers. When the switch are turned off, no sound is produced from the speakers in both recording and playback operations.

### HEADPHONE TERMINAL IS PROVIDED

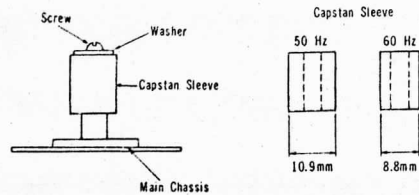
A headphone terminal is provided so that you may enjoy appealing music even in noisy surrounding or at late hours of night by yourself alone.

### tone CONTROL IS PROVIDED

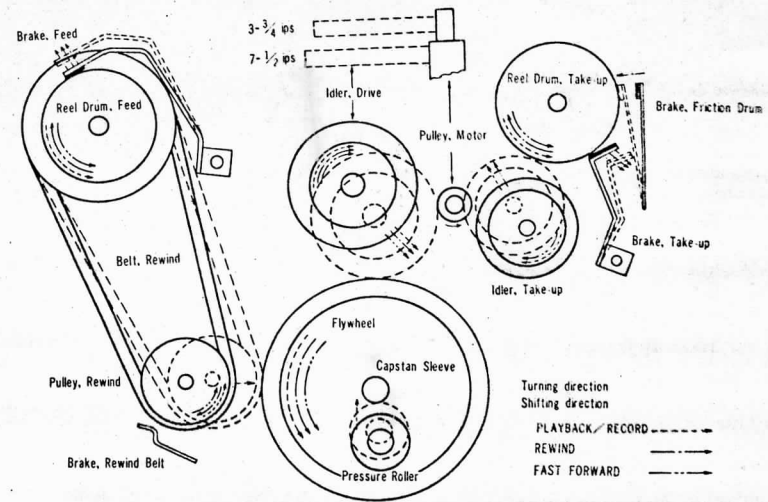
The purpose of tone control is to regulate the tonal quality of the unit to any degree between full bass and full treble. Rotating the knob to the right increases the treble and subdues the base, rotating the knob to the left increases the bass and subdues the treble.

### LINE FREQUENCY CONVERSION

For line frequency conversion of the tape recorder from 50 Hz use to 60 Hz use or in reverse, change the capstan sleeve with the one matching the line frequency. The large capstan sleeve is for 50 Hz use and the small capstan sleeve in for 60 Hz use.



## EXPLANATION OF DRIVE OPERATION



### STOP

The above illustration shows the STOP state. The feed brake is pressed against the feed reel drum and the take-up brake is pressed against the take-up reel drum, and the motor alone revolves.

### PLAYBACK/RECORD

The feed and take-up brakes are released from respective reel drums and the pressure pad is pressed against the record/playback and erase heads. The drive idler is pressed against the motor pulley and flywheel, the pressure roller against the capstan sleeve, and the take-up idler against the motor pulley and friction drum. The rotation of the motor is transmitted through the motor pulley, drive idler, and flywheel to the capstan sleeve. The tape is driven being pinched between capstan sleeve and pressure roller. At the same time, a part of the rotation of the motor is transmitted through the motor pulley, take-up idler, and friction drum to the take-up reel drum on order to take up the tape. Regarding the friction mechanism of the take-up reel drum, the friction drum is pushed upward by the friction drum spring and a frictional force is produced between friction drum and take-up reel drum felt which is bonded on the take-up reel drum.

### REWIND

The feed and take-up brakes are released from respective reel drums, but the friction drum brake is pressed against the friction drum. The drive idler is pressed against the motor pulley and flywheel, and the rewind belt against the flywheel. The rotation of the motor is transmitted through the motor pulley, flywheel, and rewind belt to the feed reel drum. Since the friction drum is engaged by the friction drum brake, the frictional force that is produced between friction drum and take-up reel drum felt is applied to the tape so that a back tension is supplied for the tape in order to prevent it against sagging.

## FAST FORWARD

The feed and take-up brakes are released from respective reel drums. The take-up idler is pushed-up into a position higher than it is in the PLAYBACK mode of operation, and is pressed against the motor pulley and take-up reel drum. The rotation of the motor is fed not through the friction drum but is fed directly to the take-up reel drum in order to drive the tape forward at a fast speed.

## PAUSE

In addition to the conditions in the PLAYBACK/RECORD mode of operation, the pressure pad and pressure roller are released, at the same time, the rewind belt brake is pressed against the rewind belt.

## SERVICE POINT

### LEVEL METER ADJUSTMENT FOR PLAYBACK

Feed a signal of 1,000 Hz through the record/playback head terminal, connect an 8 ohm dummy resistor to the speaker jack, and produce 3.5volt(1.5w) across the resistor. Under this state, adjust semi-fixed resistors R44 and R144 (5K ohm) so that pointer of the level meter is deflected to the boundary between the silver and the red scale marks.

### LEVEL METER ADJUSTMENT FOR RECORDING

Set the selector switch in the STEREO position, feed a signal of 1,000 Hz -70 dB (0.31 mV) through the MIC. jack, set the VOLUME control knob in the maximum position, and adjust the semi-fixed resistors R43 and R143 so that the pointer of the level meter is deflected to the boundary between the silver and the red scale marks.

### ADJUSTMENT OF PLAYBACK SENSITIVITY AND DIFFERENTIAL SENSITIVITY BETWEEN THE TWO CHANNELS

Set a standard 1,000 Hz tape, set the VOLUME and TONE control knobs in their maximum positions, and adjust semi-fixed resistors R15 and R115 (10K ohm) so that the stereo playback levels are made 1V to 1.5V (+4 ±2 dB). In this case the level difference between the right and the left channels must be within 1 dB.

### RECORDING CURRENT ADJUSTMENT

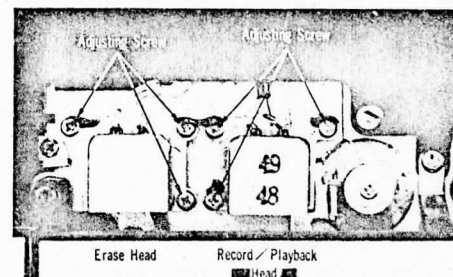
Feed a signal of 1,000 Hz -70 dB (0.31 mV) through the MIC. jack, connect a 100 ohm resistor in the ground line of the record/playback head, and adjust the semi-fixed resistors R17 and R117 (20K ohm) so that the voltage developed across the resistor is made 4.5mV(45μA). In this adjustment, the bias current must be kept cut off.

### ADJUSTMENT OF OVERALL SENSITIVITY DIFFERENCE BETWEEN TWO CHANNELS

Record a signal of 1,000 Hz -80 dB (0.1mV) through the MIC. jack setting the volume control variable resistors at their maximum positions. Next, playback the recorded signal and adjust the semi-fixed resistors R17 and R117 (20K ohm) so that the sensitivity difference between the right and the left channels is made less than 1.5 dB.

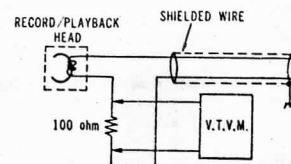
## HEAD ADJUSTMENT

A standard 7,000 Hz tape must be used for these adjustments. Connect leads (8 ohm speaker or 8 ohm resistor) across the output of both channels and set tone control to treble (maximum clockwise rotation). Use an oscilloscope or A.C. output meter across the output and Phillips screw driver for the Azimuth and Height adjustments. Azimuth and Height adjustments is a means of moving the record/playback and erase heads up or down so that the heads is positioned exactly in line with the pre-recorded information on the tape. Misadjustment of this screw would cause crosstalk.



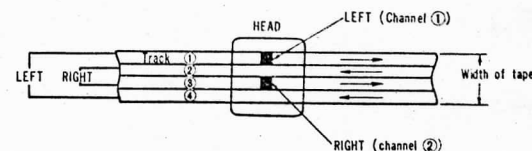
## BIAS ADJUSTMENT

Set the tape recorder in the recording state, connect a 100 ohm resistor in series to the ground-side lead wire of the record/playback head, and adjust trimmer capacitors (C25, C125) so that the voltage drop across the resistor is 55mV as measured with a A.C. meter.



## STEREO RECORDING METHOD

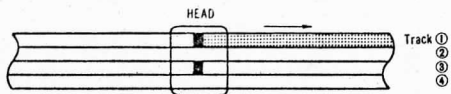
Make recording with the selector switch set in the STEREO position. Tracks ① and ④ are for the left channel and tracks ③ and ② are for the right channel.



## MONAURAL RECORDING PROCEDURE

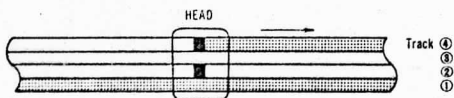
### 1. RECORDING ON TRACK ①

For recording on track ①, set the selector switch in the LEFT position and adjust the level with the left volume control.



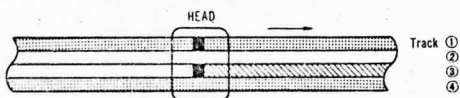
### 2. RECORDING ON TRACK ④

Then recording on track ① has been made, turnover the tape together with its reels and interchange the reel positions and then, resume recording on track ④.



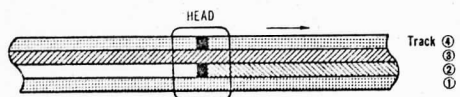
### 3. RECORDING ON TRACK ③

For recording on track ③, set the selector switch in the RIGHT position and adjust the level with the right volume control.



### 4. RECORDING ON TRACK ②

Then recording on track ③ has been made, turnover the tape together with its reels and interchange the reel positions and then, resume recording on track ②.



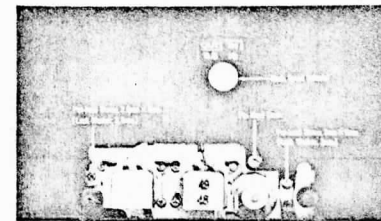
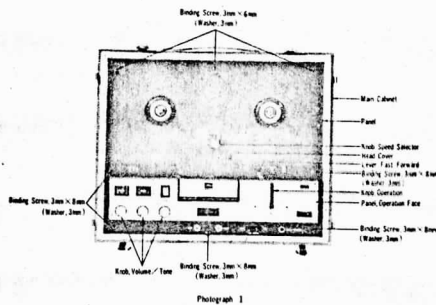
## REMOVING THE CABINET

The cabinet is constituted by the panel, operation face panel, back cover, and main cabinet.

### a) REMOVING THE PANEL AND OPERATION FACE PANEL (See Photograph 1 and 2)

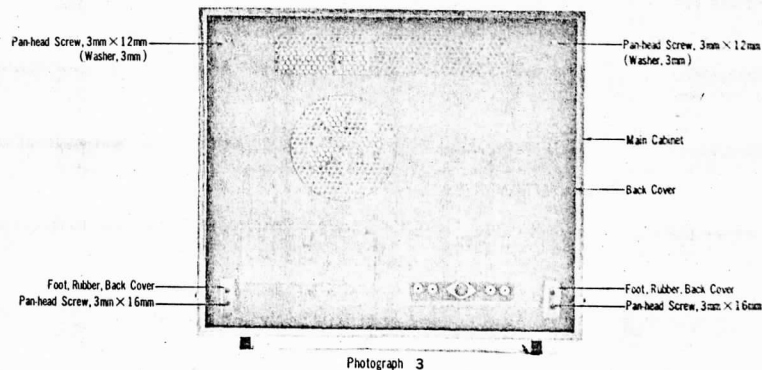
Remove the countersunk screw (3mm×5mm) of the fast forward lever, and remove the fast forward lever. Loosen the set screw of the operation knob, and remove the operation knob. Remove the three volume tone knob, speed selector knob and head cover.

Next, loosen the pan-head screw (2.6mm×6mm) in the head cover, and remove the remaining pan-head screw (3mm×6mm) also in the head cover. Next, remove the binding screws (eight screws: three screws of 3mm×6mm and the other screws of 3mm×8mm) which clamp the panel and operation face panel. When this is done, the panel and operation face panel are ready to be removed.



### b) REMOVING THE BACK COVER (See Photograph 3)

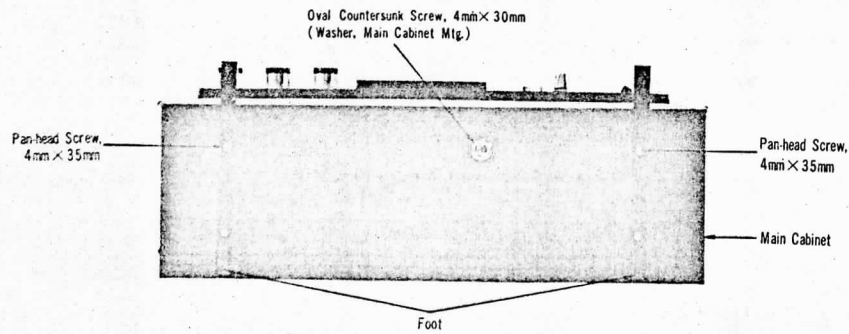
To remove the back cover, remove the two pan-head screws (3mm×12mm) which are the clamping-screws of the back cover and remove the two pan-head screws (3mm×16mm) which are of rubber feet and are indicated by arrows.



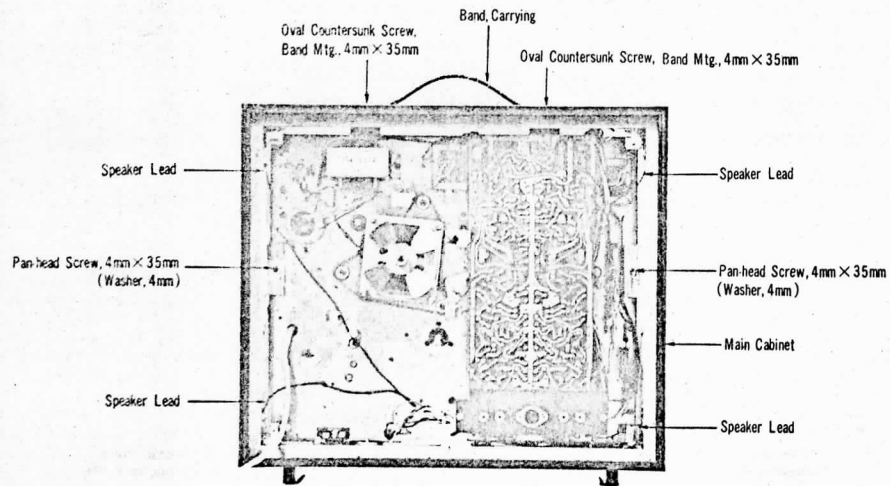
Photograph 3

**c) REMOVING THE MAIN CABINET (See Photograph 4 and 5)**

Remove the back cover. See the photograph 4, remove the oval countersunk screws (4mm×30mm) and two pan-head screws (4mm×35mm) which are of rubber feet and are indicated by arrows. See the photograph 5, unsolder the connections of the four speaker lead wires. Remove the two oval countersunk screws (4mm×35mm) from the carrying band. Remove the two remaining pan-head screws (4mm×35mm). When this is done, the main cabinet is ready to be removed from the main chassis unit.

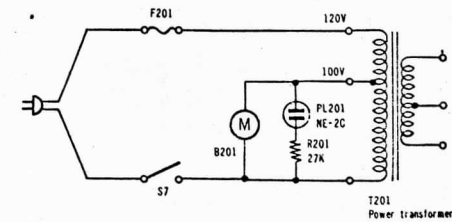
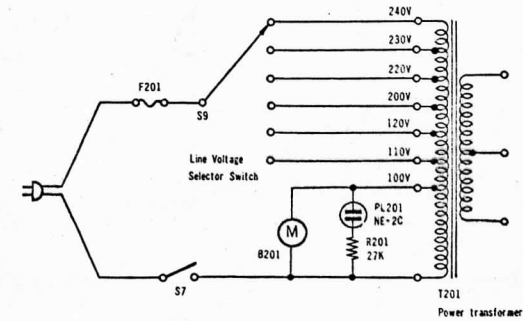


Photograph 4



Photograph 5

**LINE VOLTAGE SELECTION METHOD**



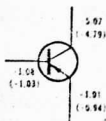
1. Insure that the power cord is disconnected from the power line receptacle.
2. The line voltage selector switch shaft is accessible through the hole drilled in the back cover.
3. Employing a screwdriver, turn the selector switch so that the desired A. C. voltage is supplied to the tape recorder.

Voltages of Transistor Electrodes

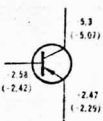
TR1, TR101  
2SB440



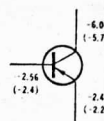
TR2, TR102  
2SB54



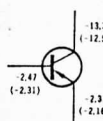
TR3, TR105  
2SB54



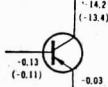
TR4, TR104  
2SB54



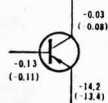
TR5, TR105  
2SB56



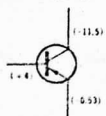
TR6, TR106  
2SB463



TR7, TR107  
2SB463

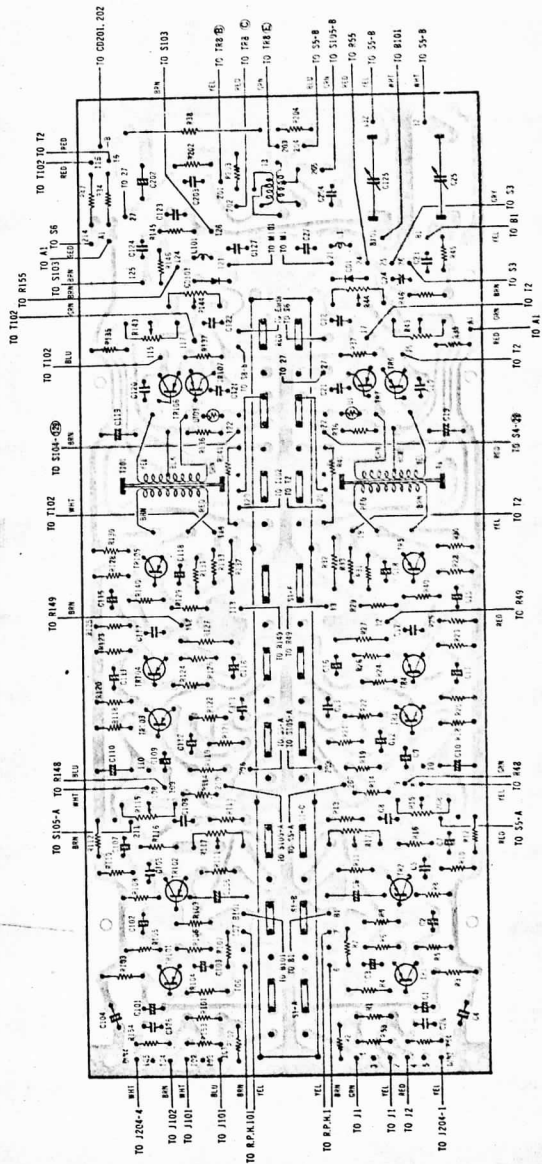


TR208  
2SB463



NOTES

1. Voltages from indicated point to chassis ground are measured by V. T. V. M. with record/playback switch (S1, S101) in playback position under no signal condition.
2. Voltages shown in parenthesis are measured with record/playback switch (S1, S101) in record position under no signal condition.
3. Voltage tolerance  $\pm 10\%$

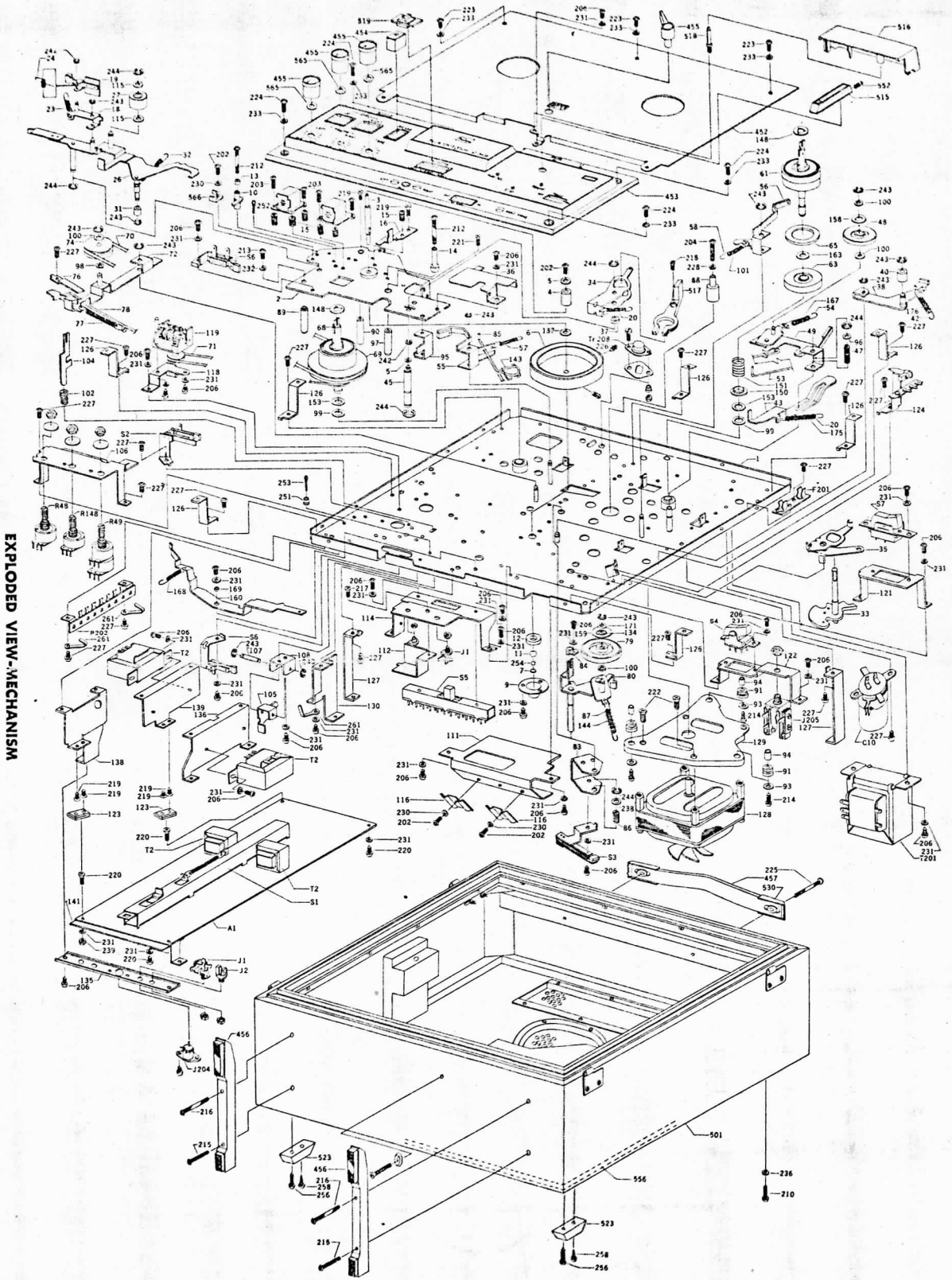


PRINTED CIRCUIT BOARD - BOTTOM VIEW  
Patched chassis. Release points and test location.

10

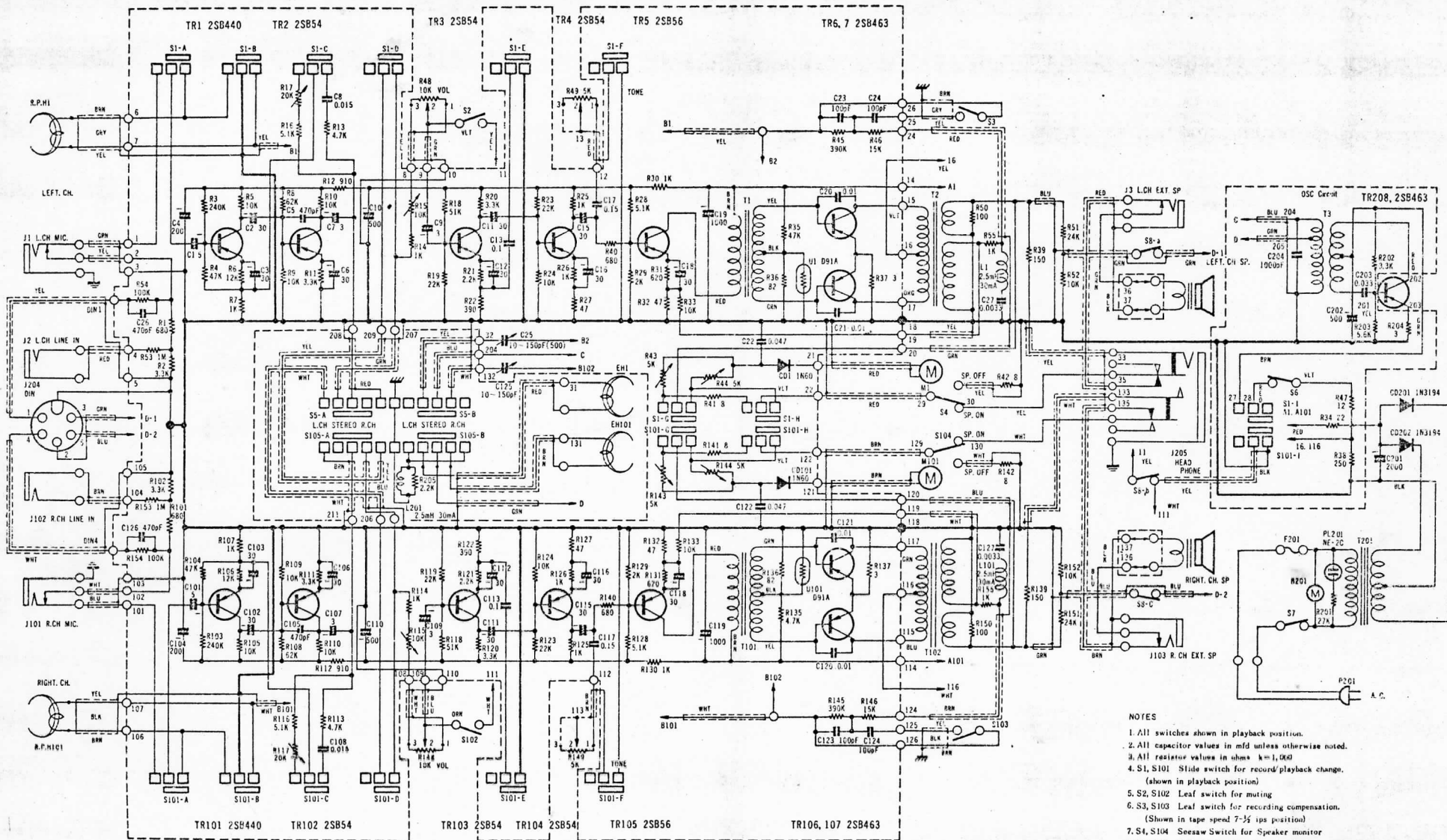
M

17



EXPLODED VIEW-MECHANISM

15



### SCHEMATIC DIAGRAM

#### NOTES

1. All switches shown in playback position.
2. All capacitor values in mfd unless otherwise noted.
3. All resistor values in ohms k=1,000
4. S1, S101 Slide switch for record/playback change.  
(shown in playback position)
5. S2, S102 Leaf switch for muting
6. S3, S103 Leaf switch for recording compensation.  
(Shown in tape speed 7-1/2 ips position)
7. S4, S104 Seesaw Switch for Speaker monitor
8. S5, S105 Slide Switch for channel selector
9. S6 Leaf switch for bias oscillator power
10. S7 Seesaw switch for power supply
11. S8 Leaf switch