

SPECIFICATIONS
Transistors....................... 2 SB $303 \times 1 \quad 2$ SB1 $86 \times 3$
2 SB $22 \times 3$
more thar 1 W
at $10 \%$ distortion more than 700 mW

| Speaker............................35/8' $(9 \mathrm{~cm})$ impedance 8 ohm |  |
| :---: | :---: |
| Recording | . 300 feet ( 90 m ).....length |
| Wow and flutter ................better than 0.4\% RMS |  |
| Signal to Noise ratio ...........better than -45 db |  |
| Frequency response $\ldots \ldots \ldots \ldots \ldots .90 \mathrm{~Hz}$ to $10,000 \mathrm{~Hz}$ within7 db band |  |
| Operating temperature.......... $0^{\circ} \mathrm{C} \sim 40^{\circ} \mathrm{C}$ |  |
| Batteries $\qquad$ UM- $2 \times 5$ pcs. (C size cell $\times 5$ ) or AC 117 V |  |
| Battery Life........................ more than 12 hours |  |
| Dimensions | $.63 / 4^{\prime \prime}(\mathrm{W}) \times 9.15 / 16^{\prime \prime}(\mathrm{L}) \times 25 / 8^{\prime \prime}$ |
|  | $(170 \times 251 \times 66 \mathrm{~mm})$ |
|  |  |

## DJUSTMENTS

## (A) Adjusting Recording Bias

The following adjustments should be made after changing a recording/playback head, an erasing head a trap L-1 (Bias frequency) or the volume control variable resistor (VR-3).

1. Supply DC 7.5 V to the unit and set it for recording condition.
2. Connect both terminals of a vacuum tube volt meter (VTVM) with R4 ( 10 ohm ) resistor in parallel as shown below. (See fig. 1)


Fig. 1
3. Adjust L-1 so as to fix the trap L-1 maximum pointer deflection.
4. Then insert the cassette and set the volume knob to conter, and tone control knob to maximum.
5. Connect an audio generator to the microphone terminal and record two electric signals ( 900 Hz and $9,000 \mathrm{~Hz}$ ) at -90 db input.
6. Connect an 8 ohm load resistor with the earphone terminal. Then play-back the signal recorded. Turn the volume knob VR ( 100 K ohm) clockwise when the play-back signal of 9 K Hz is stronger than that of 900 Hz . When the former signal output power is weaker than the latter, turn it counterclockwise. Repeat above adjustment so that the signal output power at 900 Hz is lower than that at 9000 Hz by 5 db .
7. Follow the steps from 1 to 6 when changing an erasing head, an RP head or a trap. When changing the VR, take the steps from 4 to 6.
(B) Adjusting the Meter

The following adjustment should be made after changing the meter or the volume control variable resistor (VR-4 B-100Kohm). Supply 5.5 V DC to the unit and set it for play-back condition. Adjust the VR-4 (B 100 K ohm) so that the pointer deflects as far ac the limit hetween the red and black zones.


## (C) Adjusting the Mechanism

## 1. Position of Pinch Roller

The space between the pinch roller stopper and pinch roller arm must be $0.7-1.2 \mathrm{~mm}$ when the PLAY button is pressed down. If not, adjust the angle of the pinch roller stopper by bending

fig. 2

## 2. Pressing Force of Pinch Roller

When measuring the pressure of the pinch roller as shown in figure 2. the pressure of the pinch roller should be between 270 and 320 grams. If not, adjustment is possible by resetting the pinch roller spring into another hole.
3. Adjustment of the Flywheel Support Plate
When the space between the fiywheel hub and the receptacle on the support plate is either too narrow or too wide, adjust it to $0.15 \sim 0.4 \mathrm{~mm}$ by turning the screws on the side of the plate (See fig. 3)

## 4. Adjustment of the drive roller

Appropriate pressure of the drive roller against the take-up reel should be $70-105$ grams when the PLAY button is pressed. If not, adjustment is to be made by resetting the take-up pulley spring into another hole. (See fig. 4)

fig. 3
PARTS LIST

| $\begin{aligned} & \hline \text { KEY } \\ & \text { NO. } \end{aligned}$ | PARTS NO. | DESCRIPTION | Q'ty | $\begin{aligned} & \hline \mathrm{KEY} \\ & \mathrm{NO} . \end{aligned}$ | PARTS NO. | DESCRIPTION | Q'ty |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | 1410311900800 | CHASSIS ASSY | 1 | 36 | 1412851901300 | SPRING TAKE UP PULLEY | 1 |
| 2 | 1410161901400 | BUTTON ASSY SELECT | 1 | 37 | 1410551900200 | IDLER ASSY | 1 |
| 3 | 1410315900100 | REINFORCE CHASSIS ASSY | 1 | 38 | 1410731900300 | BACE IDL.ER ASSY | 1 |
| 4 | 1412371900200 | BRACKET TRANS | 1 | 39 | 1412382903600 | FIX BATT TERMINAL SPRING | 3 |
| 5 | 1412445903400 | CUSHION MIC COMPARTMENT | 1 | 40 | 1412851905100 | SPRING BATTERY TERMINAL | 3 |
| 6 | 1412435900800 | INSULATOR FIBER AC SOCKET | 1 | 41 | 1410382901300 | BATTERY HOLDER ASSY | 1 |
| 7 | 4235970340 | AC SOCKET ASSY | 1 | 42 | 1412361900800 | BRACKET VOL | 1 |
| 8 | 1410731901400 | BASE SIIIDE ASSY | 1 | 43 | 1412852900400 | SPRING FIX CASSETTE |  |
| 9 | 1410572900200 | FLYWHEEL BEARING ASSY | 1 | 44 | 1412461900200 | TUBE TEFLON |  |
| 10 | 1410731900200 | SLIDE BASE ASSY ARM | 1 | 45 | 1412445900800 | SHEET METER | 1 |
| 11 | 1410541900100 | PINCH ROLLER ASSY | 1 | 46 | 1412445902600 | CUSHION METER | 2 |
| 12 | 1412853900200 | SPRING BALL | 2 | 47 | 1412445902700 | CUSHION SPEAKER | 1 |
| 13 | 1412472900100 | LUG | 1 | 48 | 1412564900201 | SQUARE DRIVING BELT | 1 |
| 14 | 1412851901500 | SPRING PINCH ROLLER | 1 | 49 | 1412853901000 | SPRING RECORD BUTTON | 1 |
| 15 | 1412825900100 | BALL | 6 | 50 | 1412842900100 | INTERLOCK LEVER | 1 |
| 16 | 1412851906000 | SPG SLIDE ARM BASE ACT | 1 | 51 | 4527970090 | MOTOR | 1 |
| 17 | 1412851904500 | SPRING RECORD PLAY HEAD | 1 | 52 | 4222970140 | CONTROL TONE | 1 |
| 18 | 1412521900100 | FLYWHEEL CAPSTAN | , | 53 | 4222970030 | CONTROL VOL | 1 |
| 19 | 1410351900100 | SUPPORT FLYWHEEL ASSY | 1 | 54 | 4242970060 | HEAD RECORD PLAY | 1 |
| 20 | 1410531900100 | REEL PLATE ASSY | 1 | 55 | 4242970140 | HEAD ERASE | 1 |
| 21 | 1412536900400 | CAP REEL PLATE | 2 | 56 | 4151970050 | SPEAKER | 1 |
| 22 | 1412453900200 | WASHER SPINDLE | 2 | 57 | 4511970070 | METER | 1 |
| 23 | 1412713900200 | BRAKE | 1 | 58 | 4251970070 | POWER TRANS | 1 |
| 24 | 1412731900900 | SIIDE ARM POWER SW | 1 | 59 | 4231970010 | SWITCH POWER | 1 |
| 25 | 1412825900300 | SPACER BRAKE | 1 | 60 | 1412851901600 | SPRING INTERLOCK | 1 |
| 26 | 1412852900300 | SPRING BRAKE | 1 | 61 | 1412376900700 | SPACER HEAD | 1 |
| 27 | 1412851905900 | SPRING SLIDE ARM POWER SW | 1 | 62 |  | SCREW ( $2 \mathrm{~mm} \times 5 \mathrm{~mm}$ Pan head, | 12 |
| 28 | 1410551900100 | TAKE UP PULLEY ASSY | 1 |  |  | Phil.) |  |
| 29 | 1412851901700 | SPRING IDLER BASE | 1 | 63 |  | SCREW ( $2 \mathrm{~mm} \times 4 \mathrm{~mm}$ Flat head, | 7 |
| 30 | 1412825900400 | ROLLER IDLER BASE | 2 |  |  | Phil.) |  |
| 31 | 1410551900700 | REWIND ROLLER ASSY | 1 | 64 |  | SCREW ( $2 \mathrm{~mm} \times 12 \mathrm{~mm}$ Flat head, | 1 |
| 32 | 1412551901000 | REWIND ROLLER | 1 |  |  | Phil.) |  |
| 33 | 1412851901800 | SPRING REWIND ROLIER | 2 | 65 |  | SCREW ( $3 \mathrm{~mm} \times 7 \mathrm{~mm}$ Pan head) | 2 |
| 34 | 1412352900300 | SPACER REWIND ROLLER | 1 | 66 |  | SCREW ( $2.6 \mathrm{~mm} \times 4 \mathrm{~mm}$ Truss head) | 1 |
| 35 | 1412456900200 | WASHER | 1 | 67 |  | Self tapping screw $26 \mathrm{~mm} \times 6 \mathrm{~mm}$ | 7 |



14164229002000

## SCHEMATIC DIAGRAM





| SYMBOL NO. | DESCRIPTION |  | Q'ty |
| :---: | :---: | :---: | :---: |
| Resistors |  |  |  |
| R2 | 100 ohm | 1/4 | 1 |
| R1 | 5.6K ohm | 1/4 | 1 |
| R4, 41 | 10 ohm | $1 / 4$ | 2 |
| R20, 38, | 39 ohm | 1/4 | 2 |
| R35, 37, | 68 ohm | 1/4 | 2 |
| R7, 42, | 100 ohm | 1/4 | 2 |
| R33, | 220 ohm | $1 / 4$ | 1 |
| R21, | 330 ohm | $1 / 4$ | 1 |
| R16, | 390 ohm | $1 / 4$ | 1 |
| R31, R39 | 470 ohm | 1/4 | 2 |
| R24 | 560 ohm | $1 / 4$ | 1 |
| R34, 36, | 820 ohm | 1/4 | 2 |
| R3, 5, 17, 22, 26, | 1 K ohm | 1/4 | 5 |
| R15, | 1.8 K ohm | 1/4 | 1 |
| R14, | 2.2K ohm | 1/4 | 1 |
| R10, 12, 23 | 3.3 K ohm | 1/4 | 3 |
| R19 | 5.6K ohm | 1/4 | 1 |
| R30 | 8.2K ohm | $1 / 4$ | 1 |
| R11, 27, 28 | 10K ohm | 1/4 | 3 |
| R8, 9, 40, | 15 K ohm | 1/4 | 3 |
| R6, 32 | 18 K ohm | $1 / 4$ | 2 |
| R29, 43, | 39K ohm | $1 / 4$ | 2 |
| R13 | 56K ohm | $1 / 4$ | 1 |
| R25 | 2.7K ohm | 1/4 | 1 |
| R18 | 33K ohm | $1 / 4$ | 1 |
| Capacitors |  |  |  |
| C7 | Mylar 390 PF |  | 1 |
| C32 | Mylar 330 PF |  | 1 |
| C33 | Mylar $0.0012 \mu \mathrm{~F}$ |  | 1 |
| C31 | Mylar $0.0015 \mu \mathrm{~F}$ |  |  |
| C20, 23, 24, 27, 34, | Mylar $0.01 \mu \mathrm{~F}$ |  | 5 |
| C15 | Mylar $0.013 \mu \mathrm{~F}$ |  | 1 |
| C1 | Mylar $0.018 \mu \mathrm{~F}$ |  | 1 |
| C8 | Mylar $0.033 \mu \mathrm{~F}$ |  | 1 |
| C21 | Mylar $0.047 \mu \mathrm{~F}$ |  | 1 |
| C29 | Mylar $0.001 \mu \mathrm{~F}$ |  | 1 |
| C16 | Mylar 470 PF |  | 1 |
| C5 | Alsicon $1 \mu \mathrm{~F}$ | 10WV | 1 |
| C17 | Alsicon $0.15 \mu \mathrm{~F}$ | 10WV | 1 |
| C2, 9, 11, 14, 19, 28 | Electrolytic $10 \mu \mathrm{~F}$ | 10WV | 6 |
|  | Electrolytic $33 \mu \mathrm{~F}$ | $3 W \mathrm{~V}$ | 1 |
| C4, 13 | Electrolytic $47 \mu \mathrm{~F}$ | 3WV | 2 |
| C10, 22 | Electrolytic $100 \mu \mathrm{~F}$ | 3WV | 2 |
| C18 | Electrolytic $100 \mu \mathrm{~F}$ | 10WV | 1 |
| C3, 12 | Electrolytic $220 \mu \mathrm{~F}$ | 10WV | 2 |
| C25, 26 | Electrolytic $330 \mu \mathrm{~F}$ | 10WV | 2 |
| C35 | Electrolytic $47 \mu \mathrm{~F}$ | 15WV | 1 |
| C30 | Tubelar $1000 \mu \mathrm{~F}$ | 10WV | 1 |
| C6 | Mylar $0.027 \mu \mathrm{~F}$ |  | 1 |

