

INTERNATIONAL DIVISION : SANYO ELECTRIC TRADING CO., LTD.
OSAKA, JAPAN

Speaker	4"×2½" Permanent Dynamic Speaker, 8 ohms
Microphone	Dynamic Microphone
Recording Level Indicator	Level Meter
Input Terminal	Mic. (Microphone)×1 Radio×1
Other Terminals	Extension Speaker Jack×1 Remote Control Jack×1 Foot Control Jack×1 AC Line Input Terminal×1
Motor	DC Micro Motor
Rewinding Time	Less than 3 and half minutes
Fast Forwarding Time	Less than 3 and half minutes
Power Supply	DC 9V: Six Size-D Flashlight Batteries or AC House Current 110 117V & 220 240V (50 and 60 cycles applicable)
Dimensions	11½" wide×10¼" deep×3⅝" high (292×264×94 mm)
Weight	8.6 lbs. (3.9 kg) approx. (excl. batteries)

Type of Gauges	Scale Coverage of Measurement
Tester	DC 10V, CD 10mA range
Tension Gauge	0~300 grams, 0~100 grams 0~1K grams, 0~3K grams

ADJUSTMENT OF BRAKE MECHANISM

At mode change from PLAYBACK to STOP, brake should be functioned weakly to Take-up reel and strongly to Supply reel, while from REWIND to STOP strongly to Take-up and weakly to Supply reel. Unless otherwise, tape slackens.

- Slide Metal (11) must be in close contact with both push button levers of FWD. and REW. If there are any clearance between them, adjust Spring (12). But be in mind that too much tension makes it difficult to depress push buttons.
- There should be clearance of 1~2 mm between Brake Shoe Lever (10) and Slide Metal (11). No clearance may be due to the worn out Shoe Material or its absence. Brake Shoe is designed to function normally even if it tears off up to 0.5 mm thickness.
- Amount of brake effect is adjusted by Spring (9) after a) and b).
- There should be clearance of 1~2 mm between Brake Shoe Lever (10) and Link Lever (7).
- Adjust Spring (4) if effect of brake is not sufficient when you rotate Supply Reel Base anti-clockwise. Brake adjustment of Supply Reel Base is affected by that of Take-up one.

POSITION OF PINCH ROLLER

Adjust length of Actuating Rod (17) convening between Lever (14) and Push Button Lever (16) by Nut (15). Space between Lever (14) and Nut (15) must be 0.5~1 mm when you depress PLAY button with Capstan Sleeve taken off.

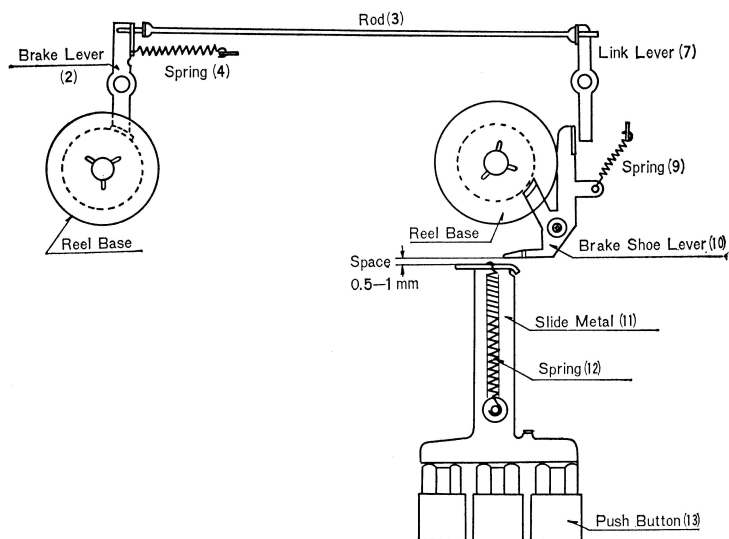


Fig. 1

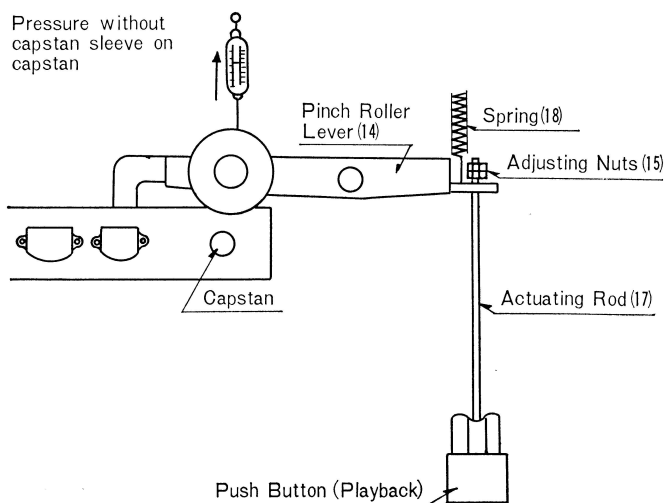


Fig. 2

MODE OF NORMAL FORWARDING

It is very important for tape to travel at constant specified speed without slippage. In order to assure this, following adjustment is necessary.

PRESSING FORCE OF PINCH ROLLER

If pressure of Pinch Roller against Capstan is not sufficiently enough, tape slippage between Capstan and Pinch Roller is noticeable.

Appropriate pressure of Pinch Roller is 350 ± 50 grams at the condition of Capstan Sleeve taking off.

ADJUSTMENT OF BACK TENSION

At the mode of RECORD/PLAYBACK and FAST FORWARD, brake works against Supply Reel Base in order not to quiver or slacken the tape.

Proper force of Brake Shoe against Reel Base is 5~7 grams with PLAY button depressed. Adjustment is made by Spring (20).

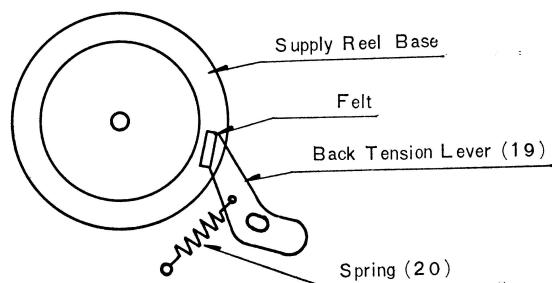


Fig. 3

ADJUSTMENT OF REWIND TORQUE

At mode of PALYBACK/RECORD tape is not wound on Reel firmly or tape slackens at the instance you operate it into PLAY BACK mode. In this case adjust the rewind torque. Load full 5" tape and reel on Take-up Spindle, and depress FWD. button... Then measure the torque at instance tape stops rotating. If the value is less than 600 grams. Bent the end of Slide Metal (21) a little bit so that the stronger thrust-up force is applied to Spring Plate (22).

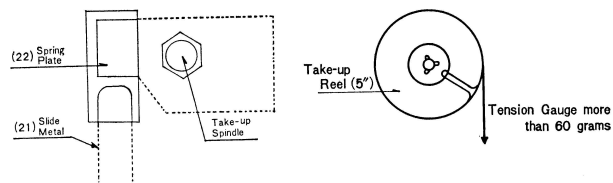


Fig. 4

Fig.

At mode of FAST FORWARD winding speed of Take-up Reel is smoothly increased even if Take-up Reel is fully loaded with 5" maximum tape, when set into FWD. mode.

Insufficient torque of this case may be due to oil stained slip felt beneath Take-up Reel base, weak pressure of Idler against Take-up Spindle Pulley, or poor thrust-up force by Slide Metal (21).

At mode of REWIND rewinding speed of Supply Reel should be increased smoothly even if Supply Reel is fully loaded with maximum quantity of 5" tape, when set into REW. mode. One of factors causing insufficient torque are weak tension of Spring (25), too tight mounting of Lever (23), or oil stain on Idler (24).

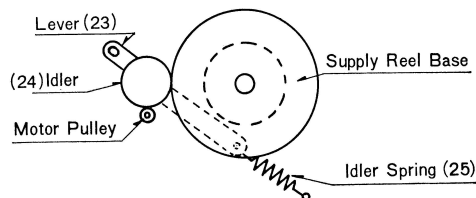


Fig. 6

Forces required to depress Push Buttons.

STOP button	Less than 2.2K grams
REW. button	Less than 2.2K grams
FWD. button	Less than 2.2K grams
REC. button	Less than 2.2K grams

REEL BASES

Vertical gap where both Reel Bases are freely movable up and down on each Spindle should be 0.2~0.3 mm at STOP mode. This gap can be adjusted by changing thickness of nylon washers under thumb screws.

PINCH ROLLER

Vertical gap should be within 0.5 mm.

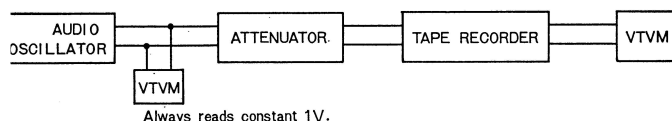
LUBRICATION

All moving parts in this recorder were lubricated during manufacture and any further should rarely be necessary. If for any reason it is necessary to replace any of the moving parts in this recorder, it is suggested that only the slightest amount of oil be applied to the bearing contacts. A single drop of oil is usually sufficient for most applications. Never permit any lubricant to contact the rubber parts of the recorder.

ADJUSTMENT & ELECTRICAL PERFORMANCE

SETTING OF STANDARD RECORDING LEVEL

Tape Recorder at REC. mode with volume control at its maximum response.



Adjust the semi-fixed resistor VR5 (5K) so that VU meter reads 0 dB (border between blue and red line with -71 dB signal input at MIC. terminal.)

RECORDING BIAS CURRENT

Measure the voltage developed across R42 and adjust the semi-fixed resistor VR3 so that it reads 7mV.

AZIMUTH ALIGNMENT OF HEAD

Use the pre-recorded standard tape with 5000 cps signal and adjust the screws for maximum output.

ADJUSTMENT OF BATTERY METER

Apply 6.5V to the unit and operate it at PLAY mode with minimum response. Adjust the semi-fixed resistor VR4 (50K) so that meter deflects border points between red and blue line.

OVERALL FREQUENCY RESPONSE

Frequency Tape Speed	200 cps	1000 cps	3000 cps	5000 cps
9.5 cm/sec	+5~-4dB	0 dB		+6~-6dB
4.75 cm/sec	+9~-1dB	0 dB	+5.5~-8.5dB	

* Input Signal Level=86 dB

Undistorted Output (T. H. 10%) more than 650mW
Signal to Noise Ratio more than 32dB
Erasing Ratio more than 60dB
Cross-talk more than 60dB

GAIN DISTRIBUTION AND FREQUENCY RESPONSE

Mode	Input Freq.	Tr-1 (C) mV	Tr-2 (C) mV	Tr-3 (C) mV	Tr-4 (C) mV	Secondary V	Tertiary V	10Ω mV	
Playback	100 cps	5.0	49.0	17.0	1800	1.7	—		Input Level -70dB
	1K cps	1.5	11.5	1.5	500	0.5	—		
	7K cps	1.3	9.5	2.4	245	0.3	—		
Record	100 cps	1.05	2.10	2.3	205	—	16.1	0.4	Input Level -70dB to MIC. jack
	1K cps	1.1	2.15	0.5	105	—	18.0	0.45	
	7K cps	1.0	2.15	4.3	400	—	23.0	1.9	

However following lubrication will be expected after long service or replacement.

- | | |
|-----------------|--------------------------------|
| A) Flywheel | D) Supply and Take-up Spindles |
| B) Pinch Roller | E) Counter |
| C) Idlers | |

ERASING CURRENT

Measure the voltage across E-head which reads 5mV (i.e. 14mA).

MEASURED VALUES OF EACH POINTS

Measuring Points	Playback (Volts)	Recording (Volts)	Range of Tester
A	15.7	14.5	25V
B	6.8	6.5	"
C	6.0	5.7	"
Tr-8 emit	8.8	8.3	"
Tr-7 coll	—	8.0	"
Tr-4 coll	7.0	6.8	"
Tr-3 coll	5.4	5.0	"
Tr-2 coll	2.3	2.4	10V
Tr-1 coll	2.1	2.3	10V
Tr-7 emit	—	1.0	"
Tr-4 emit	2.0	1.9	"
Tr-3 emit	1.8	1.7	"
Tr-2 emit	1.5	1.5	"
Tr-1 emit	2.0	2.0	"

MEASURED CURRENTS OF EACH POINTS

Measuring Points	Playback	Recording	Range of Tester
Y	16.5 mA	8.0 mA	100 mA
Z	7.5 mA	7.2 mA	25 mA
Tr-1 emit	460 μA	380 μA	1 mA
Tr-2 emit	410 μA	370 μA	1 mA
Tr-3 emit	560 μA	740 μA	1 mA
Tr-4 emit	2.2 mA	2.1 mA	1 mA
Tr-7 emit	—	42.5 mA	100 mA

PARTS LISTS OF HOUSING & CIRCUIT

STOCK NO.	DESCRIPTION	Q'ty	**
HOUSING, CIRCUIT			
R-A31656a	Top Cover Assembly	1	1
R-31656a	Top Cover	1	
R-268046	Badge, SANYO AC/DC FULL POWER	1	
R-32477	Clear Plastic Window, Tape Reel	1	
R-32549	Clear Plastic Window, Counter	1	
	Rubber Cushion, 4 ϕ xl	2	
R-471102	Operation Illustrate	1	
R-581129	Hinge, Top Cover	2	1
R-32500	Head Housing	1	2
R-A318019	Cabinet Assembly, Bottom Housing	1	1
R-318019	Cabinet	1	
R-31655a	Grille, Front Speaker	1	
R-263001	Specification Sheet	1	
R-261277	Ring Label, Volt Selector	1	
	Rubber Strip, 2.5 \times 10 \times 1t Grille	3	
	Rubber, 20 \times 15 \times 5 Cabinet Inside Bottom	2	
	Felt, 10 \times 13 \times 19 "	2	
R-S91147a	Handle	1	1
R-241192	Handle Mtg. Screw	2	2
	Nylon Washer, 8.2 ϕ \times 12 ϕ \times 0.5t Handle	4	
	Polyethylene Washer, Handle	2	
R-111564	Metal, Speaker Mtg.	2	0
R-31654b	Tape Deck Plastic	1	1
R-128024	Spindle, Tape Guide	2	0
R-12339a	Lock Spring, Top Cover—Deck Plastic	2	0
	Rubber, 6 \times 6 \times 1t Deck Plastic	2	0
R-44228	U Rubber, Deck Plastic 53mm long	2	2
R-44229	U Rubber, Deck Plastic 14mm long	2	2
R-A288007	Operating Panel Assembly	1	1
R-288009	Operating Panel, Zinc Diecast	1	
R-32562	Scale Plastic, Tone & Volume Control	1	
R-261278	Metal Ribbon, Solid State Tape Recorder	1	
R-32543a	Lid, Battery Compartment	1	1
R-32501	Slide Knob, Lid	1	1
R-12260	Spring Metal, Lid	1	1
R-581246	Knob, Tone & Volume Control	2	3
R-112570	L Metal, Battery Compartment	1	0
R-32514d	Plastic Base, Battery Terminal Mtg.	2	0
R-23773	Positive Terminal	2	0
R-148313	Negative Terminal, Taper Spring	2	1
R-471003a	Battery Sheet, Installation Instruction	1	0
R-43135	Ribbon, Battery Take-out	1	0
R-112554a	Angle, Volume Control Mtg.	1	0
R-118178	Angle, Fuse Holder Mtg.	1	0
R-118108	Angle, Rotary Switch Mtg.	1	0
R-118125	Angle, AC/DC Slide Switch Mtg.	1	0
R-368006	Vinyl Screen, AC Plug & Switch	1	0
R-112552	Angle, Meter Mtg.	1	0
R-39339	Cloth, Meter	1	0
R-41277a	Foam Cushion, Meter	4	0
	Felt, 20 \times 10 \times 10 Meter	1	0
R-112553	Angle, ALC Switch Mtg.	1	0
R-32553d	Jack Mtg. Base	1	1
R-581082	Mtg. Hinge, P. C. Board Input Jack Side	1	0
R-581083	Mtg. Hinge, P. C. Board RP Switch Side	1	0
R-112429	Mtg. Angle, P. C. Board OPT Side	1	0
R-241207	Hex Stud Nut, 13mm long	2	0
R-14207	Hex Stud Nut, 32mm long	1	0
R-112569	Mtg. Angle, P. C. Board	1	0
R-112430	Angle, Heat Sink	1	0
R-25257a	Clip Metal, Thermistor	1	0
R-39252	Switch Bed	1	2
R-25144	Contact Metal	10	20
R-13075	Spring	5	10
R-15141	Lock Pin	3	6
R-112440	Switch Metal	1	0
R-581135	Actuating Lever Assembly, RP Switch	1	0
R-12285	Tension Spring, RP Switch 6.5 ϕ 17-T	1	1
R-14239	Shaft, Pivot of Actuating Lever	1	0
R-241038a	RP Rod, 2.6 ϕ *	1	0
R-12286a	Tension Spring, RP Rod	1	1
R-241039	Boss, 8 ϕ \times 6mm long RP Rod	1	0
R-241040b	Boss, 2-stage Boss RP Rod	1	0
R-261412	Aluminum Sheet, 2SB217	1	0
R-41502	Felt, ALC Switch	1	0
R-S3163	AC Cord, Standard 2-pin	1	
R-S3574b	Plug Adaptor, Siemens 2-pin	1	
R-S3575b	Plug Adaptor, England 2-pin	1	
R-S3169	Plug receptacle, 2-pin	1	
R-S1076a	AC Cord, England 3-pin	1	
R-S8694	Plug Adaptor, Australia type 3-pin	1	
R-S3168	Plug Receptacle, 3-pin	1	

** Number in this column specifies necessary quantity of spare parts per 100 units.

STOCK NO.	DESCRIPTION	Q'ty	**
R-S6314b	Microphone, Dynamic Type with Switch 200 ohms	1	
R-S6385①	Speaker, Permanent Dynamic Type 8 ohms	1	
R-S2123	Jack, MIC & EXTENSION SPEAKER	2	6
R-S2124	Jack, RADIO	1	3
R-S2112	Jack, REMOTE & FOOT SWITCH	2	6
R-261193	Heat Sink		0
R-S1260	Fuse	2	1
R-S1038	Fuse Holder	2	0
R-S5531	Meter	1	1
R-S8347a	5" Tape and Reel	1	
R-32143b	5" Reel	1	
R-S8678b	Patch Cord	1	
	Splicing Tape	1	
VARIABLE RESISTORS			
VR2	R-R11656	1CK ohms, Volume Control	1 2
VR1	R-R11652	5K ohms, Tone Control	1 2
VR3	R-R11013	1CK ohms, Semi-fixed Bias Adjust	1 1
VR4	R-R11010	50K ohms, Semi-fixed Meter	1 1
VR5	R-R11012	5K ohms, Semi-fixed ALC	1 1
TRANSFORMERS AND COILS			
P.T	R-W7093a 1	Power Transformer	1 1
	R-W6240b 1	Input Transformer	1 1
	R-W6269	Output Transformer	1 1
	R-W8107	Oscillator Coil	1 1
	R-W1047	Choke Coil, 3mH Less than 10 ohms at DC	1 1
SWITCHES			
S12-15	R-S4311	Slide Switch, ALC	1 2
S20 & 21	R-S4266	Slide Switch, AC-DC Select	1 2
S22 & 23	R-S4315a	Rotary Switch, Supply Voltage Select	1 2
TRANSISTORS AND OTHER ELEMENTS			
Tr-1		2SB346, 1st Amplifier	1 2
Tr-2, 3		2SB186, 2nd & 3rd Amplifier	2 3
Tr-4		2SB186(Yelw), 4th Amplifier	1 1
Tr-5, 6		2SB272, Power Amplifier	2 4
Tr-7		2SB187, Bias Oscillator with fin	1 1
Tr-8		2SB217, Voltage Regulator	1 2
	R-S1182	Varistor SV-30, ALC	2 1
		1S188, Meter & ALC	2 1
	R-S1261	RD-9A, Zener Diode 8.3—9.2V	1 1
	R-S1234	FR-1P, Selenium Rectifier	2 4
CAPACITORS			
C9		0.01 μ F +30—20% 25WV, Mylar Square	
C14		0.1 μ F +30—20% 25WV, Mylar Square	
C8 C29		0.082 μ F \pm 10% 25WV, Mylar Square	
C20		80pF \pm 20% 10WV, Ceramic	
C21		250pF \pm 20% 25WV, Styrol	
C22 C23		0.005 μ F +30—20% 25WV, Mylar Square	
C27		150pF \pm 10% 25WV, Styrol	
C30 C35		0.001 μ F +10% 25WV, Mylar Square	
C31		0.004 μ F \pm 10% 25WV, Mylar Square	
C1		200 μ F 10WV V-type, Electrolytic	
C2 C5 C6			
C7 C11	R-C9131	5 μ F 6WV V-type, "	
C13 C16			
C17			
C3 C4 C10	R-C9133	30 μ F 3WV V-type, "	
C15 C25			
C12 C19	R-C9135	500 μ F 15WV V-type, "	
C24	R-C9803	500 μ F 15WV V-type, "	
C18 C26	R-C9144	500 μ F 3WV V-type, "	
C32			
C28	R-C9075	0.1 μ F 25WV V-type, " Solid Alumin	
C37	R-C9093	100 μ F 10WV V-type, "	
C39	R-C9145	100 μ F 10WV V-type, "	

RESISTORS

R1	2.7 K ohm ±10%	R22 R37 R50	330 ohm ±10%
R2 R47 R49	470K ohm ±10%	R27	1.2 K ohm "
R3	6.8 K ohm "	R28 R52	120 ohm "
R4	8.2 K ohm "	R30	12 K ohm "
R5	15 K ohm "	R32	390K ohm "
R6	18 K ohm "	R33 R54	820 ohm "
R7 R16 R19 R29	5.6 K ohm "	R34	1.8 K ohm ± 5%
R8 R23	3.9 K ohm "	R36	2.2 ohm "
R9	1 K ohm "	R38	150K ohm ±10%
R10 R35	68 ohm "	R39	82 K ohm "
R11 R18	3.3 K ohm "	R40	330K ohm "
R12 R13 R14	27 K ohm "	R41	100K ohm "
R15 R24	10 K ohm "	R42	10 ohm ± 5%
R17 R31	390 ohm "	R43	180 ohm ±10%
R20 R53	560 ohm "	R44	270 ohm "
R21 R25 R26	1.8 K ohm "	R45	27 ohm ± 5%
		R46	22 K ohm ±10%
		R51	150 ohm "
		R55	56 ohm "

All resistors are 1/4 watts.

PARTS LIST OF TAPE MECHANISM

STOCK NO.	DESCRIPTION	Qt'y	STOCK NO.	DESCRIPTION	Qt'y
R-A112638	Chassis, Mechanism	1	R-24763a	Boss, Back Tension Lever	1
R-112697	Bracket, Push Switch	1	R-15265	Spring, Back Tension Lever	1
R-44254a	Rubber Sheet, on Bracket (Push Switch)	1	R-S81210a	Reel Base, Take-up Reel	1
R-118218	Lever, Push Switch (REC, PLAY, FWD & REW)	4	R-14181	Spindle, Take-up Reel	1
R-112707	Lever, Push Switch (PLAY)	1		Felt, 20φ×24φ×1t Reel Base	1
R-14174	Shaft, Push Switch Lever Mtg.	1	R-241057	Thumb Screw, Reel Base	1
	E-ring Washer 4φ	2	R-34148b	Rubber Pulley, Reel Base Drive	1
	Fiber Washer 5.2φ×10φ×0.5t or 0.3t	4	R-25259a	Spring Plate, Rubber Pulley Thrust Up	1
R-112696	Lever, Push Levers Locking	1	R-241059	Ring, 5φ Spindle	1
R-152002a	Shaft, Above Lever Mtg.	1	R-241060a	Ring, 10φ Spindle	1
	Lock Washer, Shaft	1	R-15264b	Spring, Spindle	1
R-39285	Button, Push Switch (White or Red)	5	R-112534a	Slide Metal, Spring Plate Thrust up	1
R-15187	Spring, 4 PLAYBACK & STOP Push Buttons	2	R-15266	Spring, Slide Metal	1
R-158022	Spring 3.5 REWIND Push Buttons	1	R-S88098	Idler, Rewind	1
R-15255	Spring, 4.8 F. FORWARD Push Button	1	R-S81143	Lever, Rewind Idler	1
	Spring	1	R-241046	Boss, Rewind Idler Lever	1
R-14175	Rod, Pinch Roller Actuator	1	R-158022	Spring, Rewind Idler Lever	1
R-S81138a	Lever Assembly, Pinch Roller	1	R-44252b	Flat Belt	1
R-14178	Shaft, Pinch Roller Lever	1	R-112546	Head Pedestal Metal	1
R-15254	Spring, Pinch Roller 5 76 turn	1	R-56228	RP Head	1
R-15256	Spring, Pinch Roller 3.4 50 turn	1	R-56357	E Head	1
R-44255	Pinch Roller	1	R-25221	Spring, Head Mtg. Adjust	2
R-24809	Thumb Screw, Pinch Roller	1	R-241044	Tape Guide	2
	E-ring Washer, Pinch Roller Lever	1	R-S81145	Switch, Capstan Sleeve Rest	1
R-112528	Lever, Amplifier Switch (S16)	1	R-S88067	Tape Pad Assembly	1
R-241063	Boss, Above Lever	1	R-128002	Pad Metal, Felt Pasted	1
R-S4313a	Switch, Amplifier (S16)	1	R-258013	Hinge Faces Heads	1
R-S4334	Switch, Power Supply (S17)	1	R-112544	Base Hinge	1
R-S4312	Switch, Motor Governor (S18)	1	R-12290	Shaft, Hinge	1
R-S5110d	DC Motor,	1	R-158031	Rod, Pad Metal Mtg.	1
R-241048a	Pulley, Motor Shaft	1	R-43138	Felt	2
R-29017	Shield Metal, Motor noise	1	R-12222	Spring, Pad Tension	2
R-112533	Lever, Rewind Lever in contact with REW Button	1	R-112536	Slide Metal, Brake Actuator	1
R-24916	Boss, Rewind Lever	1	R-112694	Brake Shoe Lever, Take-up Reel	1
R-13083a	Spring Plate, Rewind Lever	4	R-15267	Spring, Slide Metal	1
R-118090a	Slide Metal, Motor Mtg.	1	R-241063	Boss, Brake Shoe Lever	1
R-241050b	Boss, Slide Metal	3	R-	Spring, Brake Shoe Lever	1
R-241208	Brass Wire, Slide Metal	1	R-112538a	Link Lever, Brake	1
R-112777	Guide Metal, Belt	1	R-241053	Rod, Supply Reel Brake Actuating	1
R-S81140a	Flywheel	1	R-15268	Spring, To protect Vibration of Rod	1
R-22037	Bearing, Flywheel Shaft	1	R-112539a	Brake Shoe Lever, Supply Reel	1
R-112541	Bracket, Bearing Mtg.	1	R-24763a	Boss, Shoe Lever (Supply Reel) & Link Lever	2
R-S81141	Capstan	1	R-15186	Spring, Brake Shoe Lever (Supply Reel)	1
R-34146d	Roller, Fast Forward Idler	1		Shoe Material	2
R-S81139	Lever, Fast Forward Idler Mtg.	1		Bracket	1
R-241050b	Boss, F. FWD Spring Wire Hook	1	R-55807	Counter	1
R-15222	Spring Wire, Fast Forward	1	R-44269	Belt, 70mm Reel Base to Pulley	1
R-S81136a	Reel Base, Supply Reel	1	R-44268	Belt, 53mm Pulley to Aluminum Pulley	1
R-241057	Thumb Screw, Reel Base	1	R-27048	Pulley, Aluminu	1
R-S81137a	Spindle with Bracket, Supply Reel	1	R-34162	Pulley, Bakelite	1
R-112532	Lever, Back Tension for Supply Reel	1	R-14199	Shaft, Pulley	1
	Felt, 6×10×1t Back Tension	1		E-ring Washer 3φ	1

SUGGESTIONS FOR MECHANICAL TROUBLE

Trouble	Cause	Repair
Capstan fails to rotate	<p>*Defect of motor</p> <ol style="list-style-type: none"> Open in motor coil of defective contact of carbon brush. Burnt metal bearing. <p>*Defect of Transmission mechanism.</p> <ol style="list-style-type: none"> Skidding of motor pulley. Oil on flat belt rubber. Lack of oil on capstan shaft. Defective flat belt. 	<ol style="list-style-type: none"> Replace. *If capstan turns in Rapid Winding, or Rewinding, but fails in Recording or Playback, the cause is the defective contact of Governor. Therminal resistance of normally operating Governor at both ends should be 0 ohm. Replace. Tighten the screw. Clean. *Wipe with alcohol or Carbon Tetra Chloride. Lubricate between oilless metal and shaft. Replace.
Slow rotation	<p>*Defect of motor</p> <ol style="list-style-type: none"> Burnt metal bearing <p>*Defect of Transmission mechanism.</p> <ol style="list-style-type: none"> (Same as 3-5) Lack of oil in Takeup reel idler Lack of oil in Takeup reel pulley 	<ol style="list-style-type: none"> Replace or lubricate. Lubricate. Lubricate.
Presence of wow and flutter	<p>*Defect of motor</p> <ol style="list-style-type: none"> Defective function of Governor. <p>*Defect of transmission mechanism</p> <ol style="list-style-type: none"> (Same as 3-10) Alien objects on flywheel rubber. Deterioration of flywheel rubber. <p>*Detective movement of recording tape</p> <ol style="list-style-type: none"> Defective back tension on Rewinding Reel. Defective pressure of Pinch Roller. Change of quality or shape of Pinch Roller. Adherence of dust on points contacting recording tape. 	<ol style="list-style-type: none"> Lubricate or Replace. Clean. (Same as 4) Replace. Replace. Adjust Pinch Lever Spring. Replace. Clean (Wipe with Carbon Tetra Chloride)
Unsatisfactory winding.	<p>*Reel Base does not rotate even when the tape is not mounted.</p> <ol style="list-style-type: none"> Broken belt or change of quality. Weak transmission of Winding Idler & Winding Reel Pulley. (Same as 1-10, 16 & 19). <p>*Reel base does not rotate when the tape is mounted.</p> <ol style="list-style-type: none"> Weak pressure of Rapid Forwarding Roller, Reel Base & Reel Base Pulley. Lack of oil on Reel Base. 	<ol style="list-style-type: none"> Replace belt. Adjust Winding Idler Spring. Adjust Rapid Winding Roller Spring. Lubricate
Unsatisfactory rewinding.	<p>*Reel base does not rotate either with or without reel or tape.</p> <ol style="list-style-type: none"> Weak transmission between Winding Idler & Rewinding Idler. (Same as 1-10, 16 16 19-21) 	<ol style="list-style-type: none"> Adjust Rewinding Function Disc B.
Brake does not function	<p>*Defect of Brake</p> <ol style="list-style-type: none"> Peeled brake shoe. Brake shoe touching Winding Reel Base Pulley. Defective adjustment. (Same as 29). 	<ol style="list-style-type: none"> Use adhesive. Adjust the size of Brake shoe. *In case of Right Reel. Adjust spring. *In case of Left Reel Brake, adjust Brake Function Disc D.

Trouble	Cause	Repair
Unable to record.	*Switch fails to function the recording circuit 30. Defective joint of RP slide Lever B and C.	30. Tighten screw. *In adjusting the screw, press Rec. Button, and adjust the position of switch with over stroke so that RP Slide Switch will become Recording position.
Unable to erasing	31. Weak pressure of Head Pad.	31. Adjust *Loosen the Pad fastening screw, and bring the pad forward or move the head front, or replace felt with thicker one.
Uneven winding of tape.	*During Recording or Playback 32. Reel shaft is not perpendicular to operating panel. 33. Weak Takeup Reel Base Pulley Spring. 34. Pressure difference at top & bottom of Pinch Roller & Capstan.	32. Replace. *Replacement is extremely difficult as Reel shaft is fastened tight on to chassis. 33. Adjust spring. 34. Replace Pinch Lever, or adjust.

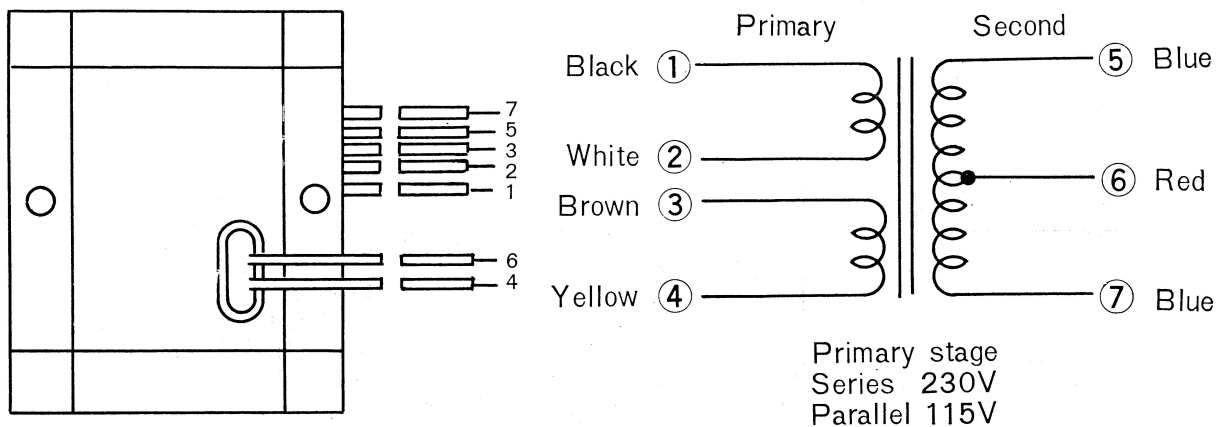
SUGGESTION FOR ELECTRICAL TROUBLE

Trouble	Cause	Repair
<p>*Even when the button is pressed.....</p> <p>*Motor fails to rotate and indicator needle does not move.</p>	<p>1. In case of AC:</p> <p>*Blown or loose fuse.</p> <p>*Bad or inadequate connection of power cord, plug.</p> <p>*Broken line in transformer, primary and secondary.</p> <p>*Short circuit in C27, bad silicon rectifier.</p> <p>*TR-8 bad.</p> <p>Inadequate contact of S21</p> <p>2. In case of DC:</p> <p>*Batteries drained, and inadequate contacts or connections.</p> <p>3. Both AC and DC:</p> <p>*Inadequate connection of S.17, S.20.</p> <p>4. Both AC and DC:</p> <p>*Bad indicator.</p> <p>*Bad of semi-fixed VR 50K ohm in amplifier.</p> <p>(When needle does not rise as expected.)</p> <p>5. *Bad motor or broken line.</p> <p>*Bad remote control jack or foot control switch jack.</p> <p>*Bad S18, bad motor wiring.</p> <p>*S18 does not turn on.</p> <p>*Specified voltage does not reach the motor.</p> <p>AC-DC</p> <p>6. Short circuit in negative side. AC</p> <p>7. Bad of power transformer, leveling condenser (C27).</p> <p>8. Bad of diode rectifier.</p> <p>9. Short circuit of primary side of PT</p>	<p>Check,</p> <p>Replace or Repair.</p> <p>Check voltage, replace.</p> <p>Check, adjust or replace.</p> <p>Replace.</p> <p>Replace. (Adjust)</p> <p>Check.</p> <p>Check.</p> <p>Adjust.</p> <p>Check voltage & ampere of power source.</p> <p>Check each part of amplifier and motor.</p> <p>Check voltage & induction.</p> <p>Check, replace.</p>
<p>*Motor rotates but indicator needle fails to rise.</p>	<p>*Bad of amplifier (incl. Power output transformer).</p> <p>*Bad of recording/playback head, sealed lead wire connection.</p>	<p>Check voltage of each part, repair.</p>
<p>*Indicator needle rises but motor fails to rotate.</p>		
<p>*Motor fails to pick up speed in rewinding and rapid winding.</p>		
<p>*Low voltage of power source on amplifier side.</p>		
<p>*High Voltage of power source on amplifier side. AC</p> <p>*Cannot record or playback.</p>		

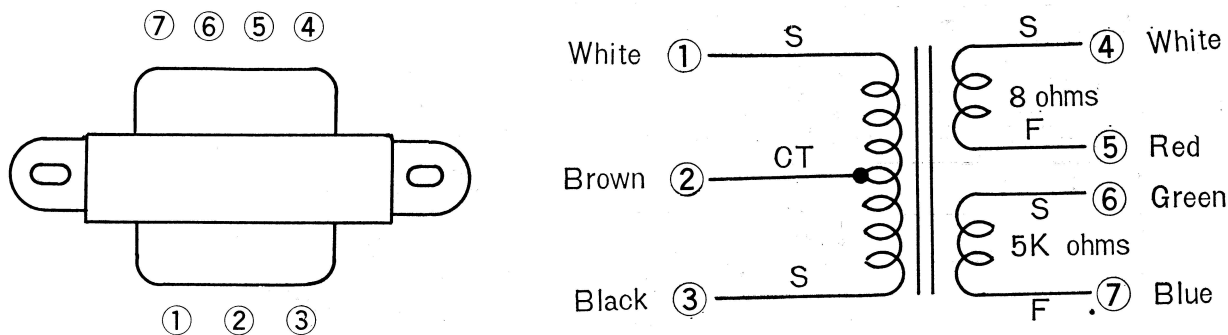
Trouble	Cause	Repair
*Can playback but cannot record.	*Inadequate contact of tape and recording/playback head.	Check mechanism of switch.
Indicator works	*Inadequate function or contact of S16.	Check each element and wiring.
Erasing insufficient	*Insufficient contact of RP switch	Check, repair.
*Can record but cannot playback.	*RP switch does not function or bad contact.	Check mechanism of switch.
	*Bad microphone or input jack.	Connect earphone to EXT SP jack and check.
	*Bad electrical circuit. (R22, C10, R21)	Repair, replace.
	*Bad of bias oscillation circuit. (Especially R45, C26)	Check indicator to see if needle swings in recording.
	*Broken wire in OPT 3rd stage coil.	Check, replace.
	*Broken wiring of erasing head or R43	Check, replace.
	*Bad RP switch, or bad contact.	Check, replace.
	*Bad speaker or its wiring broken.	Check, replace.
	*Insufficient contact of EXT SP jack.	Check, replace.
	*Broken wiring or short circuit of power output transformer.	Check, replace.
*Statics & Noises.	*Bad contact of VR.	Check.
	*Bad of transistor. (Particularly TR-1)	Check, erase magnetism.
	*Deterioration of circuit element contact with adjacent element, insufficient soldering.	Check and adjust circuit elements.
	*Magnetized RP head	Check, repair.
	*Distortion of bias oscillation wave.	Check, replace.
	*Inadequate grounding of printed circuit plate.	Check, replace.
*Increased noise in recording with microphone.	*Bad microphone.	Check, replace.
	*Insufficient insulation of C2.	Check, replace.
	*Insufficient capacity of filter circuit (C1, C18, C16)	Check, replace.
*Inferior tone quality	*Bad of circuit element or transistors.	Check, voltage & ampere of each part.
	*Inadequate AC bias.	Check bias current.
	*Inadequate contact of tape and head.	Check loading of tape, contact points and clean.
	*Worn down RP head.	Check, replace.
	*Bad microphone.	Check, replace.
	*Bad speaker.	Check, replace.
*Insufficient high tones	*Inadequate RP head angle adjustment.	Adjust so that RP head slit is perpendicular to tape.
	*Inadequate value of AC bias value.	Check, adjust.
	*Capacity of C28, R4, VR1, C18, C19 too large, and resistance value insufficient.	Repair.
	*Lack of pressure of RP head pad.	Check, repair.
*Tones too high.	*Lack of capacity of C4, C7, C15, C17.	Check, repair.
	*Broken wiring of tone circuit, R14, VR1, C29, C36.	Adjust position.
*Cannot erase.	*Inadequate position of erasing head.	Clean.
	*Insufficient contact of erasing head and tape.	Check DC erasing current.
	*Lack of erasing current.	Check, replace.
	*Broken wiring or short circuit of erasing head.	Adjust tape guide or height of head.
*Mixing of recorded materials of tracks 1 and 2.	*Inadequate, position of tape guide, or vertical movement of tape that tilts the head.	Adjust.
	*Inadequate positioning of head for upper and lower tracks.	Check voltage & ampere of each part.
*Lack of volume.	*Deterioration of transistors or circuit elements.	Check, repair or replace.
	Short circuit, broken wiring or insufficient soldering of circuit elements. (Especially emitter circuit, pass emitter circuit, pass condenser bad)	Check, repair or replace.
	*Bad bias oscillation circuit.	Check, repair or replace.
	*Bad head, microphone or speaker.	Check, repair or replace.

MAIN PARTS CONNECTION

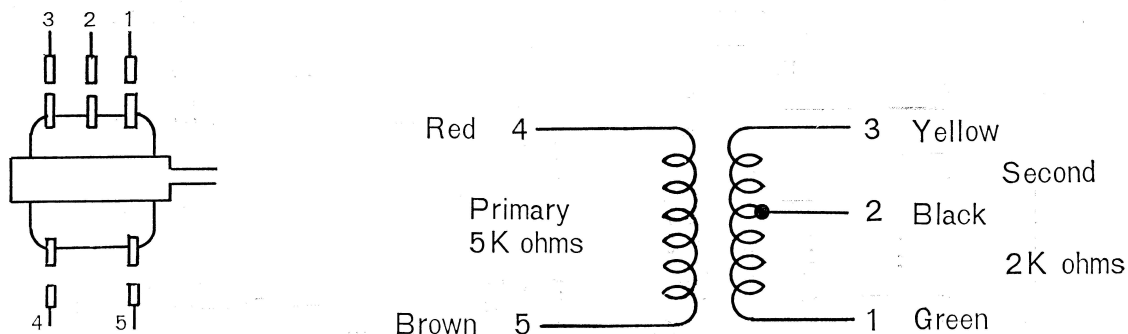
Power Transformer R-W7093



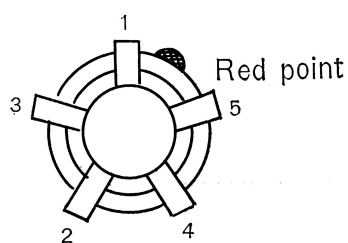
Output Transformer R-W6269



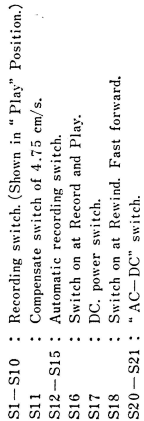
Input Transformer R-W62406



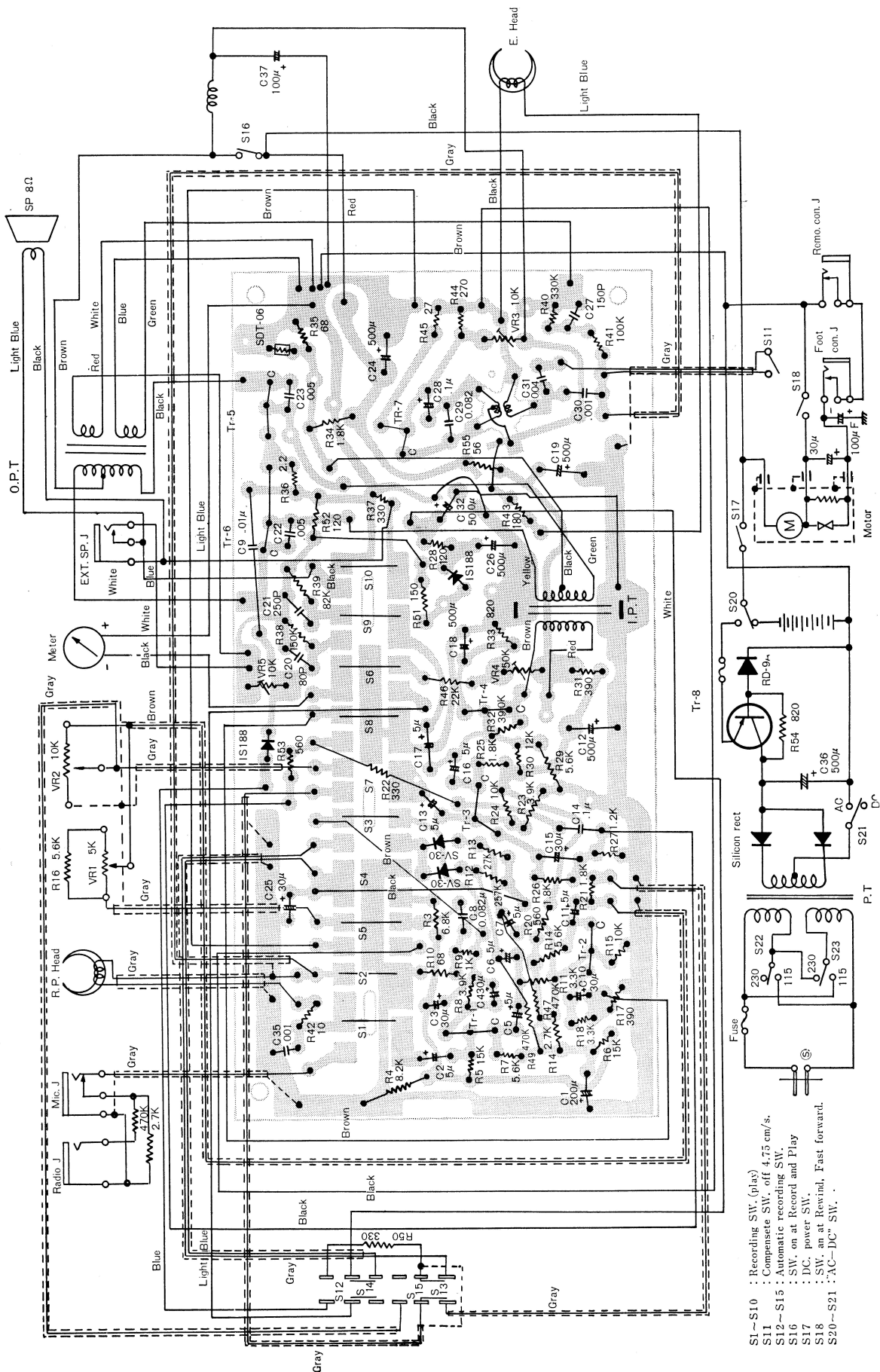
Oscillator Coil R-W8107



Oscillating Frequency 50K c/s 25%



INTER PARTS WIRING ILLUSTRATION



- S1 ~ S10 : Recording SW. (play)
 S11 : Compensate SW. off 4.75 cm/s.
 S12 ~ S15 : Automatic recording SW.
 S16 : SW. on at Record and Play
 S17 : DC. power SW.
 S18 : SW. on at Rewind, Fast forward.
 S20 ~ S21 : AC-DC SW.