

97

TEAC[®]



SERVICE MANUAL

C-3X

Stereo Cassette Deck

1 SPECIFICATIONS AND SERVICE DATA

NOTES:

- Improvements may result in changes in specifications and service data.
- 0 dB is referenced to 0.775 V in this manual unless otherwise specified.
- All the electrical numeral values are for STANDARD speed unless otherwise specified.

SPECIFICATIONS

Track System 4-track, 2-channel stereo

Heads 3: Erase, record and playback

Type of Tape Cassette tape, C-60 and C-90 (Philips type)

Tape Speed 4.75 cm/s (1-7/8 ips), 9.5 cm/s (3-3/4 ips)

Input (level and impedance)

MIC: Specified input level: -57 dB (1.09 mV)/10k ohms
Minimum input level: -67 dB (346 μ V)

LINE IN: Specified input level: -9 dB (275 mV)/50k ohms
Minimum input level: -19 dB (86.9 mV)

Output (level and impedance)

OUTPUT: Maximum output level: -2.5 dB (581 mV)/50k ohms
Specified output level: -5 dB (436 mV)

PHONES: Specified output level: -15.8 dB (126 mV)/8 ohms

Equalization

	HIGH	STANDARD
METAL	3180 μ s + 35 μ s	3180 μ s + 70 μ s
Co(CrO ₂)	3180 μ s + 35 μ s	3180 μ s + 70 μ s
NORMAL	3180 μ s + 50 μ s	3180 μ s + 120 μ s

Head Configuration

1/2-track, 1-channel erase head

1/4-track, 2-channel record head and playback head in a single housing

Motors 1 DC servo capstan motor

1 DC reel motor

Bias Frequency 100 kHz $\pm$ 5 kHz

Operation Position Horizontal

Power Requirements

100/117/220/240 V AC, 50/60 Hz, 41 W (General export model)

117 V AC, 60 Hz, 41 W (U.S.A./Canada model)

220 V AC, 50 Hz, 41 W (Europe model)

240 V AC, 50 Hz, 41 W (U.K./Australia model)

Weight 9 kg (19-3/16 lbs.) net

Dimensions See Fig. 3-2

* Noise Reduction System and Headroom Extension System manufactured under license from Dolby Laboratories Licensing Corporation.
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dbx noise reduction system made under license from dbx, Incorporated. The word dbx and the Symbol are trademarks of dbx, Incorporated.

SERVICE DATA

MECHANICAL

Tape Speed Deviation 3,000 Hz $\pm$ 45 Hz

Tape Speed Drift 30 Hz

Wow and Flutter

	HIGH	STANDARD
Playback	0.065% (WRMS)	0.08% (WRMS)
Record/playback	0.18% (RMS)	0.25% (RMS)

Pinch Roller Pressure 390 g to 490 g (13.8 oz to 17.3 oz.)

Reel Torque (at STANDARD speed)

Take-up: 45 to 65 g-cm (0.625 to 0.903 oz-inch)

Supply: 3 to 8 g-cm (0.0417 to 0.111 oz-inch)

F.F. & REW: 90 to 160 g-cm (1.25 to 2.22 oz-inch)

Fast Winding Time

90 seconds for MTT-501 (C-60)

ELECTRICAL

Frequency Response

See Figs. 5-9 to 5-13.

Signal-to-noise Ratio

Playback	Better than:	
	HIGH	STANDARD
METAL, Co(CrO ₂)	55 dB	52 dB
NORMAL	53 dB	48 dB

Overall	Better than:	
	HIGH	STANDARD
METAL, Co(CrO ₂)	49 dB	48 dB
NORMAL	46 dB	45 dB

S/N is improved by 5 dB at 1 kHz and 10 dB above 5 kHz when Dolby NR* is used.

Erase Efficiency 65 dB min. at 1 kHz (measured with input 10 dB higher than the specified input level)

Channel Separation 35 dB min. at 1 kHz

Adjacent Track Crosstalk 40 dB min. at 125 Hz

Total Harmonic Distortion 2.0% or less with NORMAL, Co(CrO₂) and METAL tapes

CAUTION

△ Parts marked with this sign are safety critical components. They must always be replaced with identical components - refer to the TEAC Parts List and ensure exact replacement.

2 PARTS LOCATION

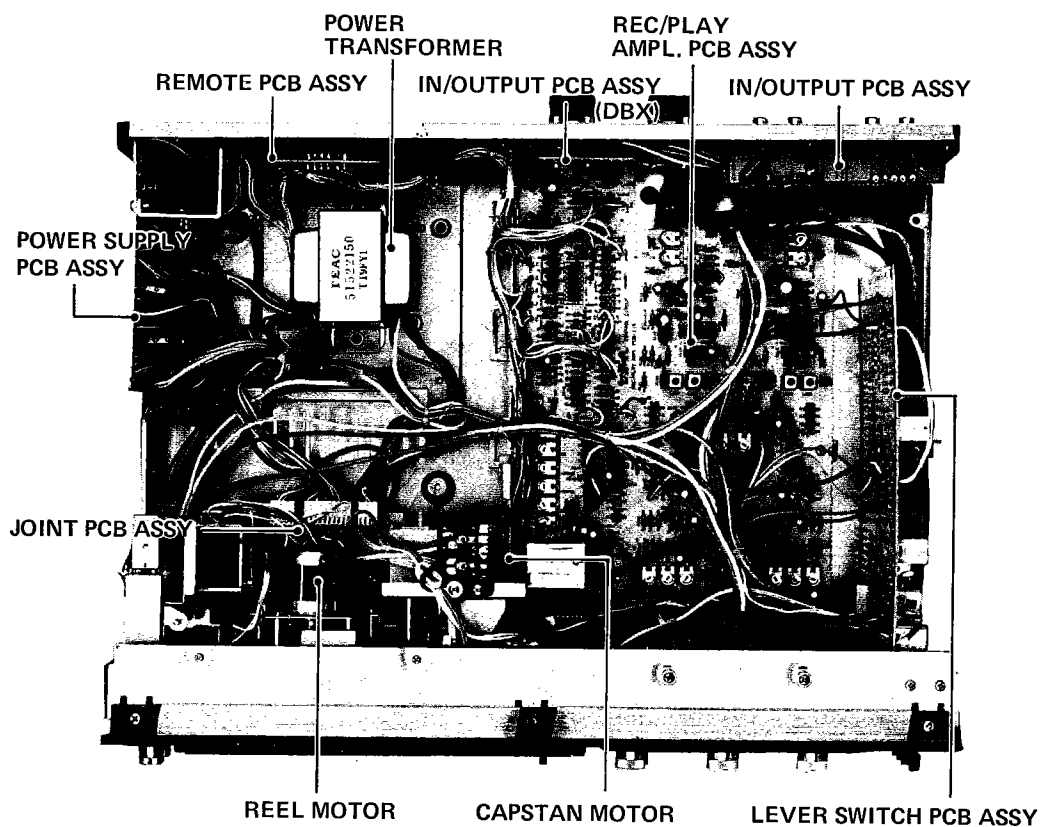


Fig. 2-1

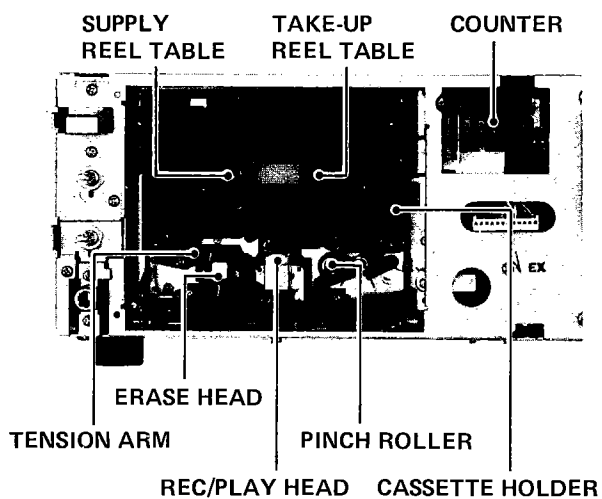


Fig. 2-2

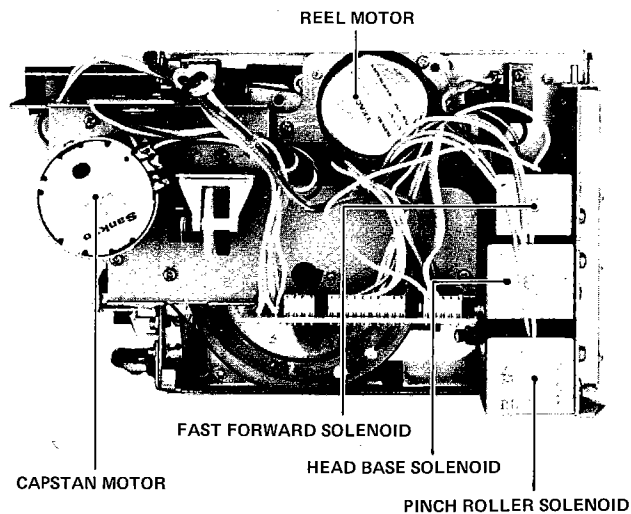


Fig. 2-3

3 REMOVAL OF EXTERNAL COMPONENTS

Disassemble in number-order

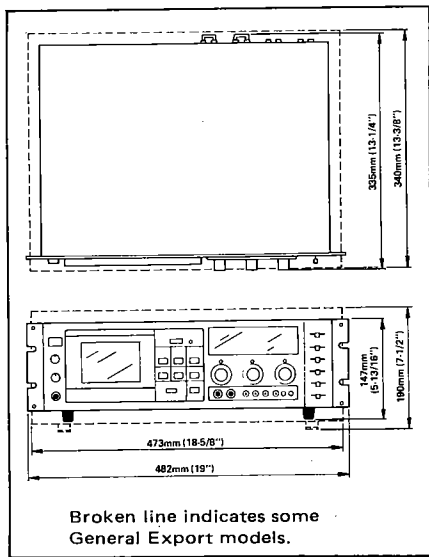


Fig. 3-2 Dimensions

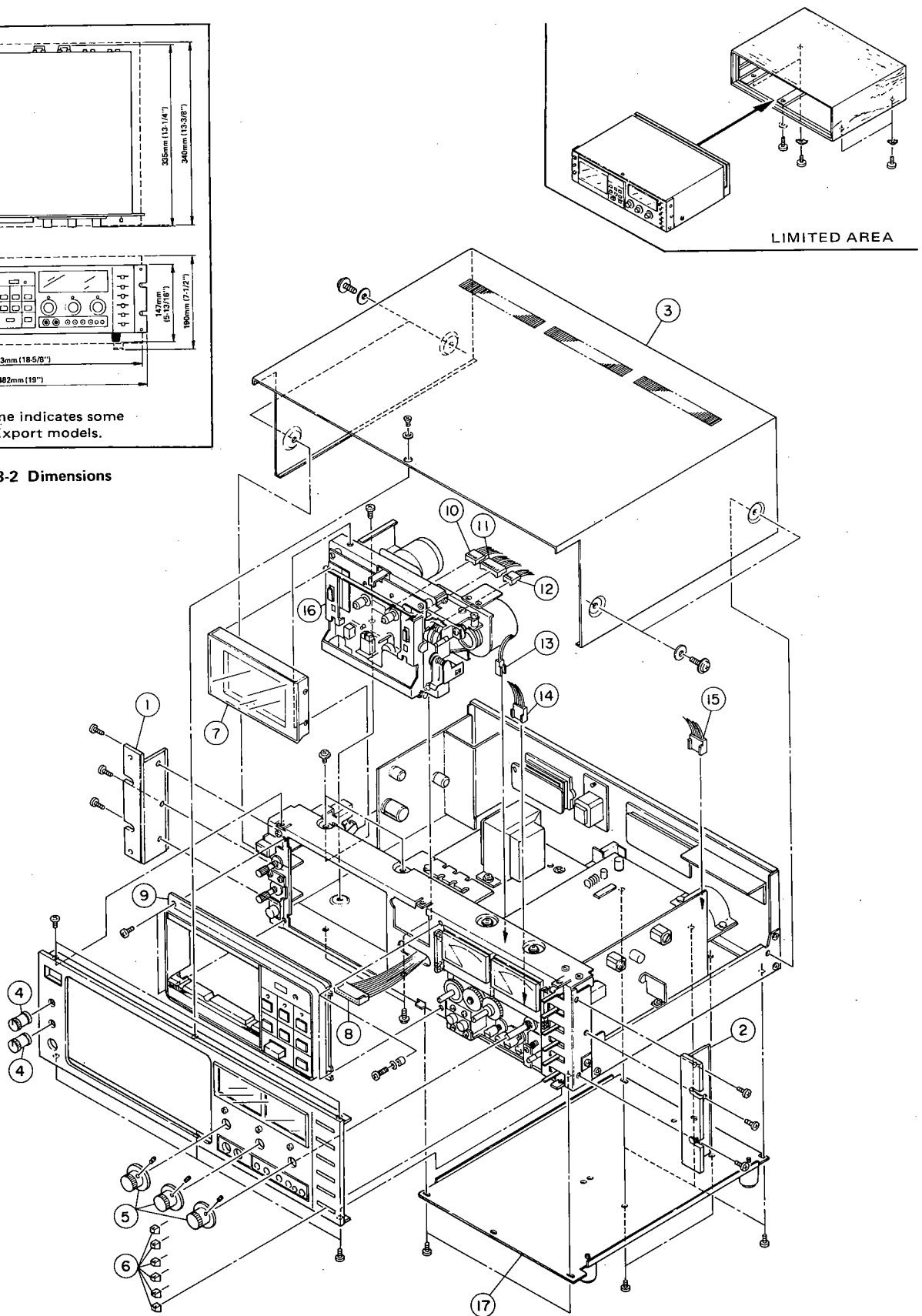


Fig. 3-1

4 MECHANICAL ADJUSTMENTS AND CHECKS

Note: All checks and adjustments are made with the SPEED switch set to STANDARD, unless otherwise indicated.

4-1 REEL TORQUE

1. Load the cassette torque meter on the deck and read the pointer indication on the dial scale for each tape transport operation. The measured torque should be within the following values:
 Take-up: 45 to 65 g-cm (0.62 to 0.90 oz-inch)
 Supply: 3 to 8 g-cm (0.042 to 0.11 oz-inch)
 F.F. and REW: 90 to 160 g-cm (1.25 to 2.22 oz-inch)

4-2 PINCH ROLLER PRESSURE

1. With the cassette holder shut and no tape loaded, put the deck in PLAY mode.
2. Hook a spring scale on the top of the pinch roller assembly plate, as shown in the illustration.
3. Pull the scale down until there is sufficient force to separate the pinch roller from the capstan shaft.
4. Ease pressure until the pinch roller makes just enough contact with the capstan shaft so that the pinch roller just begins to turn. At this point, note the reading on the scale. It should be from 390 g to 490 g (13.8 oz. to 17.3 oz.)
5. If the pressure is not within the prescribed specifications, it may be adjusted by first removing the pinch roller spring from the pinch roller assembly and then bending the spring as shown in the illustration.

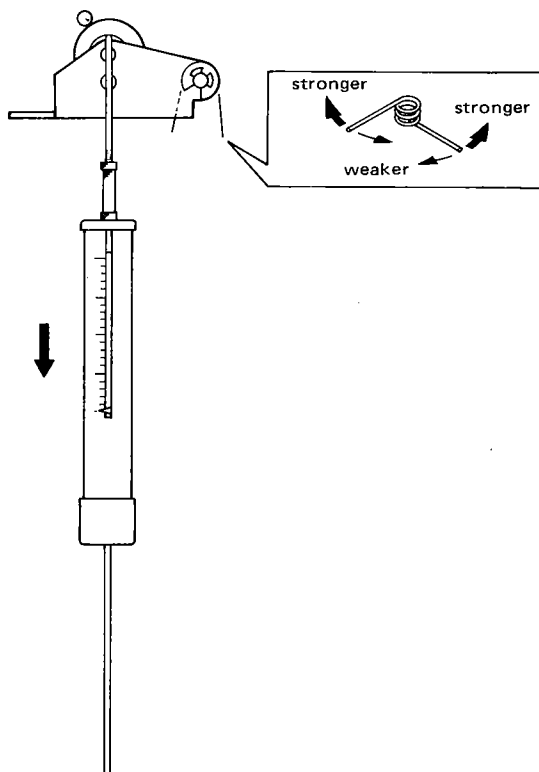


Fig. 4-1

4-3 HEAD BASE PLATE POSITIONING

1. Set the deck in the PLAY mode.
2. Push the head base plate by hand in the direction of the arrow and check that the head base plate and the stopper portion of the mechanism chassis make contact.
3. If there is any clearance, loosen the two screws on the head base plate solenoid and reposition the solenoid until the clearance is eliminated.

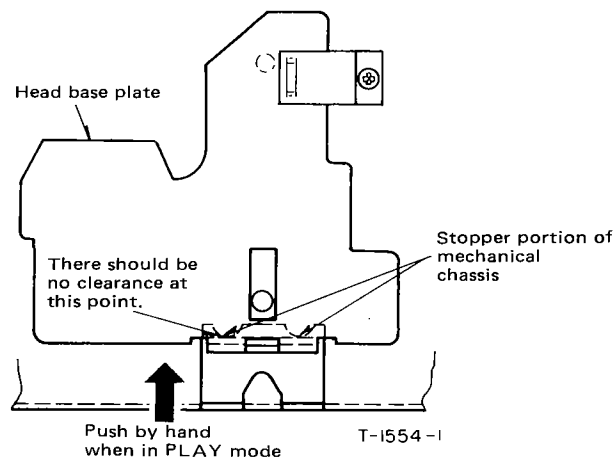


Fig. 4-2

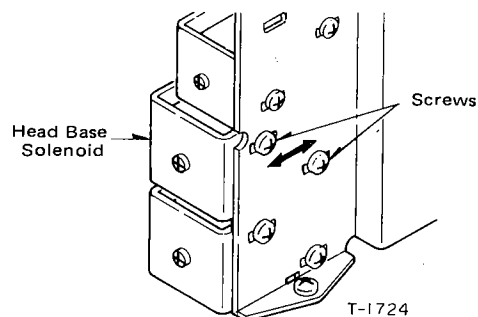


Fig. 4-3 Head base solenoid location

4-4 CAPSTAN ASSEMBLY THRUST

1. Turn the thrust adjusting screw so that thrust of the capstan shaft is within 0.05 mm to 0.15 mm.

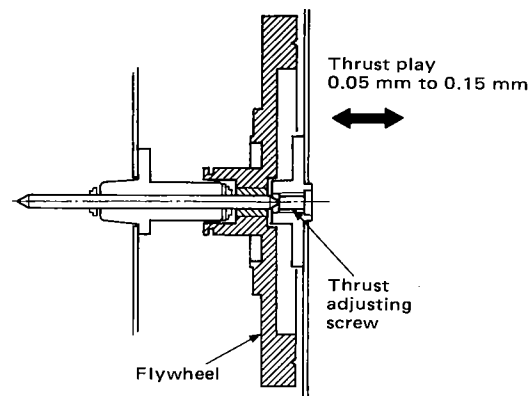


Fig. 4-4

4-5 TAPE SPEED

STANDARD speed

1. Connect a frequency counter to the deck as shown in Fig. 4-5.
2. Play a tape for about five minutes to warm up the deck, then load a TEAC MTT-111 test tape containing a 3000-Hz test tone and play the test tape from the beginning.
3. While the tape is playing, use a common slotted screwdriver with the handle completely insulated from the blade, and adjust the control on the MOTOR PCB (as far as possible) for a reading of 3000 Hz (Spec. 3000 Hz $\pm$ 5 Hz) on the frequency counter.
4. Play the tape at the beginning and at the end, and check that the speed deviation is within the prescribed limits by observing that the reading on the frequency counter never deviates more than $\pm$ 45 Hz from 3000 Hz, nor drifts more than 30 Hz at any given time.

HIGH speed

5. Set the deck to HIGH speed and follow all the procedures described above. Since the speed is doubled, all the values described in the preceding steps are also doubled to be compatible.
6. If the tape speed is not within the prescribed specifications, check the pinch roller pressure and the tape transport mechanism for any abnormality, and make sure the tape path is clean.

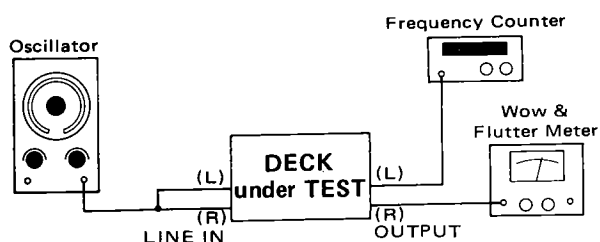


Fig. 4-5

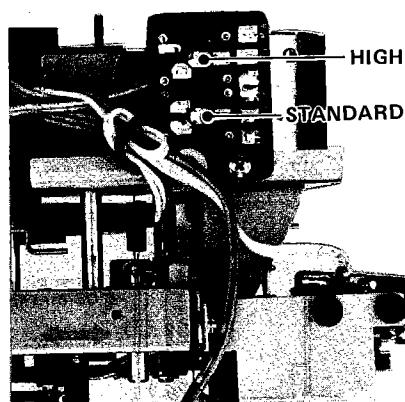


Fig. 4-6 Tape speed adjustment location

4-6 WOW AND FLUTTER

Note: These measurements should be made at the beginning, middle, and the end of the tape.

1) PLAYBACK

STANDARD Speed

1. Connect a wow-and-flutter meter to the deck as shown in Fig. 4-5.
2. Load and play a TEAC MTT-111 test tape.
3. Check that the reading on the wow-and-flutter meter is within 0.08% (WRMS).

2) SIMULTANEOUS RECORD/PLAYBACK METHOD

STANDARD Speed

4. Load a TEAC MTT-501 test tape (blank) and record a 3000-Hz signal.
5. With the MONITOR switch in the TAPE position, note the reading on the wow-and-flutter meter, it should not be more than 0.25% (RMS).

HIGH Speed

6. Repeat the above procedures with the deck set to HIGH speed. The wow and flutter should not be more than 0.18% (RMS).

3) NON-SIMULTANEOUS RECORD/PLAYBACK METHOD

STANDARD Speed

7. Rewind the tape to the beginning of the recorded section previously made in step 4, and play it at STANDARD speed.
8. The wow and flutter should not be more than 0.25% (RMS).

HIGH Speed

9. Rewind the tape to the beginning of the portion previously recorded in and play it at HIGH speed. The wow and flutter should not be more than 0.18% (RMS).

4-7 MICROSWITCH (A) ASSEMBLY CLEARANCE

1. Insert a blank cassette and close the cassette holder.
2. Loosen the two screws on the microswitch (A).
3. Move the switch so that actuator of the switch contracts the safety lever.
4. Adjust the switch position to obtain a clearance of between 0.1 mm to 0.3 mm.
5. Retighten the screws.

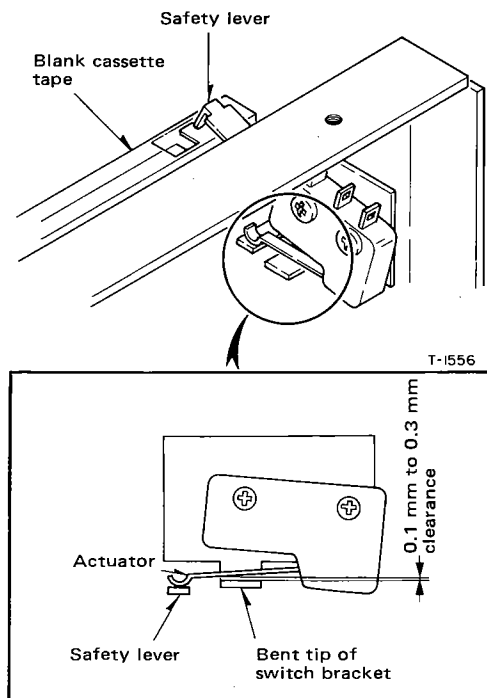


Fig. 4-7

4-8 MICROSWITCH (B) ASSEMBLY CLEARANCE

1. Push the EJECT button to open the cassette holder.
2. Loosen the two screws on the microswitch (B).
3. Move the switch so that switch actuator contacts the bent projecting portion of the eject lever.
4. Adjust the switch position to obtain a clearance of approximately 1 mm.
5. Retighten the screws.

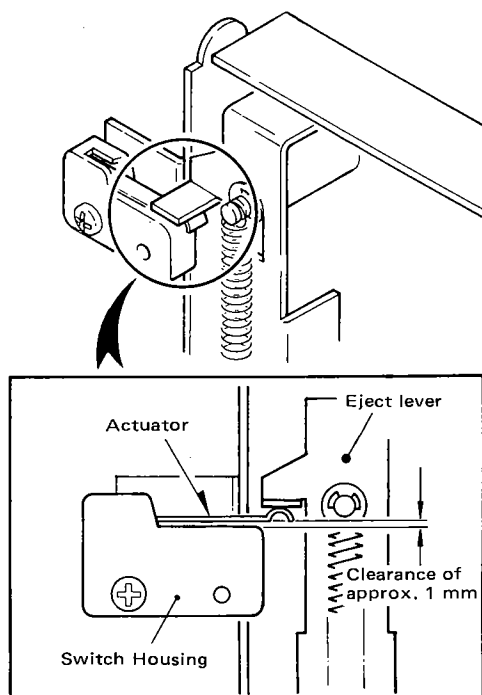


Fig. 4-8

4-9 LUBRICATION

Lubrication is only required when parts are replaced. For this purpose, use the oil and grease specified below.

Oil: TEAC spindle oil (from TEAC TZ-255 oil kit), Mobil D.T.E. Oil Light, or equivalent

Grease: ORE-LUBE G1/3 or equivalent

1. Apply a drop of oil with an oil applicator to a point about 1/3 the way down the shaft (from the free end) of the flywheel, then insert the shaft into the capstan housing.
2. Apply a suitable amount of light grease to the well of the flywheel bearing.

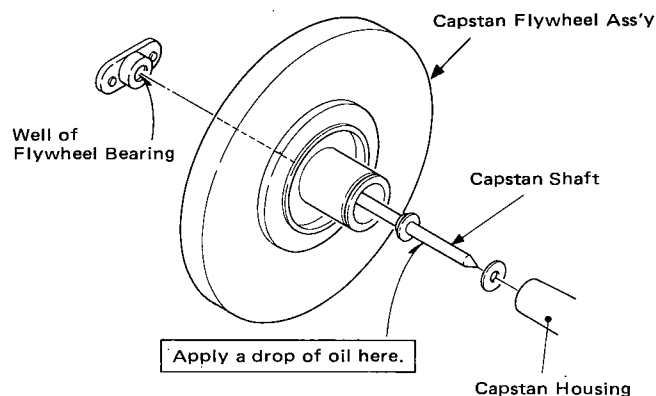


Fig. 4-9

4-10 VOLTAGE SELECTION (FOR GENERAL EXPORT MODELS)

1. Always disconnect the power line cord before making these adjustments.
2. Remove the top cover of the deck by removing the screws from the sides.
3. Locate the voltage selector, shown in the illustration (in front of the power transformer).
4. Loosen the two screws in the shorting bar and move the bar so that it jumpers the opposing terminals marked with the required voltage (100, 117, 220 or 240).
5. Retighten the screws and replace the top cover.

4-11 AC POWER LINE FREQUENCY

Since the C-3X uses a DC servo motor, 50 Hz or 60 Hz operation is permitted without any change in power line frequency.

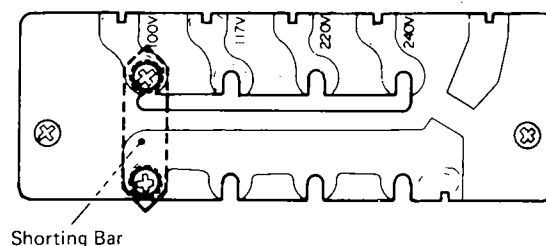


Fig. 4-10

5 ELECTRICAL ADJUSTMENTS AND CHECKS

PRECAUTIONS

1. Before beginning any checks or adjustments, clean and demagnetize the entire tape path.
2. Make sure the deck is properly set for the voltage in your locality.
3. In general, adjustments and checks are done in the order of L-ch then R-ch. Double REF. NOs. and test point designations indicate L-ch/R-ch.
(Example: R11/R21)
4. For this deck, 0 dB is referenced to 0.775 V. If you are using an AC voltmeter which references 0 dB to 1 V, appropriate compensation should be made.
5. The AC voltmeter used in the procedures must have an input impedance of 1M ohms or more.
6. Note the "Deck settings" at the top of each chart. These settings must be used for all the checks in each chart unless explicitly stated otherwise.

-70 dB or more . . . What does it mean?

In reference to some specifications, you may come across an expression like: "-70 dB or more". This means that the lower the value of this specification, the greater the absolute value of the specification and the better the performance of the deck. For instance, a noise floor of -76 dB is better than -70 dB, because this means that the level of noise is lower. So in this case, "-70 dB or more" means at least as good a value as -70 dB and maybe even better, i.e., -71 dB.

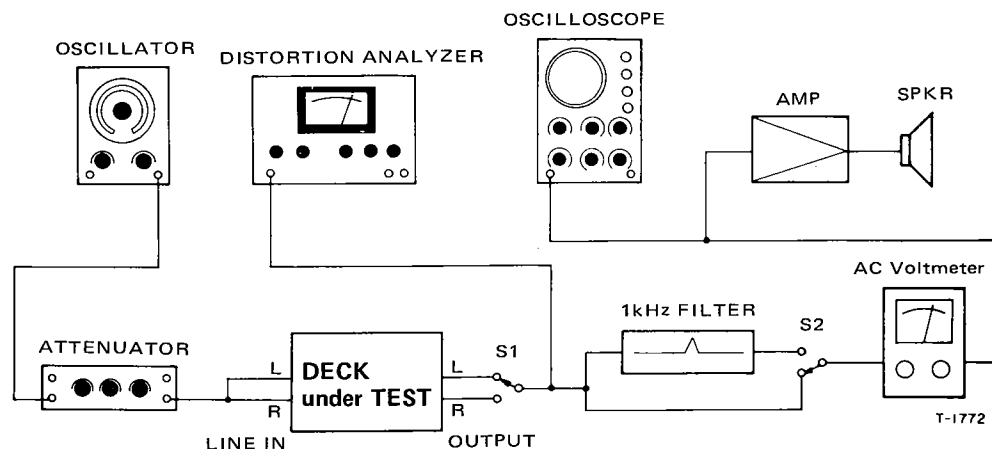


Fig. 5-1 Basic test setup

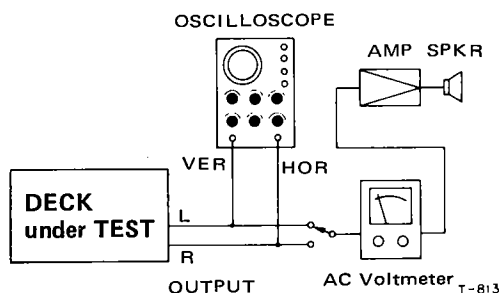


Fig. 5-2 Test setup for azimuth check

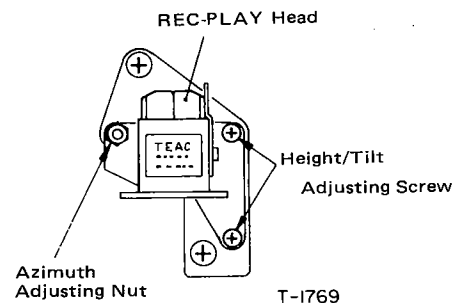


Fig. 5-3 Azimuth adj. nut location

Deck settings:

MONITOR sw.: TAPE

NR SYSTEM sw.: OUT

SPEED sw.: STANDARD

EQ sw.: METAL

TEAC test tapes:

MTT-150: For Dolby level calibration

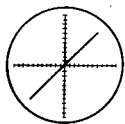
MTT-316: For playback frequency response
check for METAL, Co(CrO₂)

MTT-216: For playback response check for NORMAL

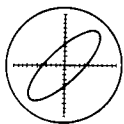
5-1 PLAYBACK PERFORMANCE

ITEM	SETTING	INPUT SIGNAL	ADJUST (or CHECK)	MEASURING POINT: RESULT	REMARKS
1. REC/PLAY head azimuth	Conn.: Fig. 5-2 OUTPUT cont.: convenient output level position	MTT-316 (12.5 kHz)	Azimuth nut of R-P heads (Fig. 5-3)	OUTPUT: • Phase: about 0° on 'scope (Fig. 5-4) • Max. output on VTVM	
2. Phase shift	Same as above	MTT-316	Check	OUTPUT: Phase: 45° min. (315 Hz) 90° min. (12.5 kHz)	
3. Specified output level	—	MTT-150	R11/R21	TP1/TP2 -2.5 dB (581 mV)	
	—	MTT-150	OUTPUT cont.	OUTPUT: -5 dB (436 mV)	• Spec. setting of OUTPUT cont. • Spec. output level
IMPORTANT: Do not change the OUTPUT cont. setting after establishing the proper settings as above.					
4. PEAK LEVEL meter	—	MTT-150	R12/R22	PEAK LEVEL meter: 0 dB	
5. Frequency response	EQ: METAL, Co(CrO ₂) Adjust for 10 kHz to be the same level as ref. signal (315 Hz)	MTT-316	R10/R20	OUTPUT: Fig. 5-9	
	EQ: NORMAL	MTT-316	Check	OUTPUT: At 10 kHz, should be 3 dB to 6 dB higher than measured in above step.	
6. Signal-to-noise ratio	SPEED: STANDARD and HIGH EQ: METAL Co(CrO ₂) NORMAL	Fully-erased tape: (Use bulk tape eraser) .. METAL MTT-5061 MTT-501	Check	OUTPUT: } { 52 dB min. (STD) 55 dB min. (HI) .. { 48 dB min. (STD) 53 dB min. (HI)	Ratio of spec. output of -5 dB to noise
7. Headphone output level	Conn.: Fig. 5-5	MTT-150	Check	PHONES: -15.8 dB ±3 dB (89.0 mV to 178 mV)	8 ohm load

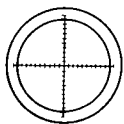
0° (IN PHASE)



45°



90°



180°

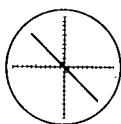


Fig. 5-4 Confirming phase relationship

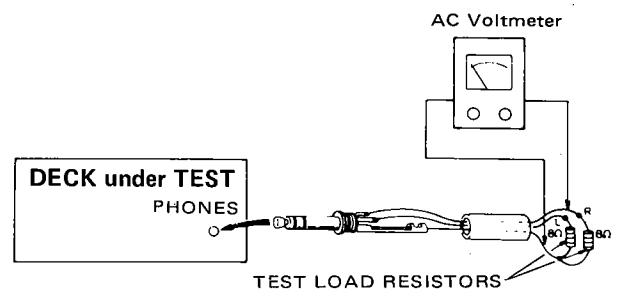


Fig. 5-5 Test setup for headphone check

Deck setting:
 REC-PAUSE mode
 MONITOR sw.: SOURCE
 NR SYSTEM sw.: OUT
 INPUT sw.: LINE
 OUTPUT cont.: Specified position (item 3)

5-2 MONITOR PERFORMANCE

ITEM	SETTING	INPUT SIGNAL	ADJUST (or CHECK)	MEASURING POINT: RESULT	REMARKS
8. Min. input level	RECORD cont.: Max INPUT sw.: MIC	MIC: 400 Hz/-67 dB (346 μ V)	Check	OUTPUT: -5 dB $\pm$ 3 dB (308 mV to 615 mV)	MIC min. input level
	INPUT sw.: LINE	LINE IN: 400 Hz/-19 dB (86.9 mV)	Check	OUTPUT: -5 dB $\pm$ 3 dB (308 mV to 615 mV)	LINE min. input level
9. LINE specified input level	—	LINE IN: 400 Hz/-9 dB (275 mV)	RECORD cont. (L/R)	OUTPUT: -5 dB (436 mV)	Specified setting of RE- CORD cont.
	—	LINE IN: 400 Hz/-9 dB (275 mV)	Check	DOLBY TP (TP1/TP2): -2.5 dB $\pm$ 0.5 dB (548 mV to 615 mV)	
	IMPORTANT: Do not change the setting of the RECORD or OUTPUT controls, after establishing their setting as above.				
10. PEAK LEVEL meter	—	LINE IN: 400 Hz/-9 dB (275 mV)	Check	PEAK LEVEL meter: 0 dB $\pm$ 1 dB	
11. "TEST IN"	INPUT sw.: TEST	LINE IN: 400 Hz/-29 dB (27.5 mV)	Check	PEAK LEVEL meter: 0 dB $\pm$ 2 dB	

Deck settings:
 MONITOR sw.: TAPE
 NR SYSTEM sw.: OUT
 INPUT sw.: LINE
 SPEED sw.: STANDARD
 ADJUST/PRE-SET sw.: PRE-SET
 OUTPUT cont.: Specified position (item 3)
 RECORD cont. (L/R): Specified position (item 9)

TEAC test tapes:
 MTT-5061: For record test with Co(CrO₂)
 MTT-501: For record test with NORMAL
 METAL: For record test with METAL

5-3 RECORDING PERFORMANCE

ITEM	SETTING	INPUT SIGNAL	ADJUST (or CHECK)	MEASURING POINT: RESULT	REMARKS
12. BIAS trap	Record-pause mode	LINE IN: No signal	L104/L204	BIAS TRAP TP (TP3/TP4): Min. reading	
13. Record bias	BIAS, EQ: METAL Tape: METAL	LINE IN: 400Hz & 10 kHz alternately/-42 dB (6.15 mV)	R15/R25	OUTPUT: Nearly equal level at both frequencies	
	BIAS, EQ: Co(CrO ₂) Tape: MTT-5061	LINE IN: 400 Hz & 10 kHz alternately/-42 dB (6.15 mV)	R14/R24	OUTPUT: Nearly equal level at both frequencies	
	BIAS, EQ: NORMAL Tape: MTT-501	LINE IN: 400 Hz & 10 kHz alternately/-42 dB (6.15 mV)	R13/R23	OUTPUT: Nearly equal level at both frequencies	

ITEM	SETTING	INPUT SIGNAL	ADJUST (or CHECK)	MEASURING POINT: RESULT	REMARKS
14. Record level	BIAS, EQ: METAL Tape: METAL	LINE IN: 400 Hz/−12 dB (195 mV)	R16/R26	OUTPUT: −8 dB (308 mV)	
	BIAS, EQ: Co(CrO ₂) Tape: MTT-5061	LINE IN: 400 Hz/−12 dB (195 mV)	R17/R27	OUTPUT: −8 dB (308 mV)	
	BIAS, EQ: NORMAL Tape: MTT-501	LINE IN: 400 Hz/−12 dB (195 mV)	R18/R28	OUTPUT: −8 dB (308 mV)	
15. Frequency response	SPEED: STANDARD and HIGH BIAS, EQ: METAL Tape: METAL	LINE IN: Required signal/ −42 dB (6.15 mV)	Check	OUTPUT: Fig. 5-10	
	BIAS, EQ: Co(CrO ₂) Tape: MTT-5061	LINE IN: Required signal/ −42 dB (6.15 mV)	Check	OUTPUT: Fig. 5-10	
	BIAS, EQ: NORMAL Tape: MTT-501	LINE IN: Required signal/ −42 dB (6.15 mV)	Check	OUTPUT: Fig. 5-11	
	If frequency response is out of specification, recheck #13. "Record bias".				
16. Total harmonic distortion	Same as above, but with STANDARD tape only	LINE IN: 400 Hz/−12 dB (195 mV)	Check	OUTPUT: 2% or less distortion	
17. Signal-to-noise ratio	SPEED: STANDARD and HIGH BIAS, EQ: METAL Tape: METAL	LINE IN: 1 kHz/−9 dB (275 mV) ↓ no signal	Check	OUTPUT: 48 dB min. (STD) 49 dB min. (HI)	Ratio of specified output of −5 dB to noise
	BIAS, EQ: Co(CrO ₂) Tape: MTT-5061	LINE IN: 1 kHz/−9 dB (275 mV) ↓ no signal	Check	OUTPUT: 48 dB min. (STD) 49 dB min. (HI)	
	BIAS, EQ: NORMAL Tape: MTT-501	LINE IN: 1 kHz/−9 dB (275 mV) ↓ no signal	Check	OUTPUT: 45 dB min. (STD) 46 dB min. (HI)	
18. Erase efficiency	• Connection is same as in Fig. 5-1, but engage 1-kHz filter. • Record a 1-kHz signal. Rewind tape to midpoint of recorded portion. Record a "no signal" portion. Find the difference between the 1-kHz portion and the "no-signal" portion.				
	BIAS, EQ: METAL Tape: METAL	LINE IN: 1 kHz/+1 dB (0.869 V) ↓ no signal	Check	OUTPUT: 65 dB min. ratio	Ref. output level: +5 dB (1.38V)
19. REC MUTE function	• Connection: Fig. 5-1, but engage 1-kHz filter. • Record a 1-kHz signal. Push REC MUTE button for several seconds. Rewind and play the tape. Find the difference between the 1-kHz portion and the "no-signal" portion.				
	BIAS, EQ: Co(CrO ₂) Tape: MTT-5061	LINE IN: 1 kHz/+1 dB (0.869 V) ↓ no signal	Check	OUTPUT: 65 dB min. ratio	Ref. output level: +5 dB (1.38 V)
20. Channel separation	• Connection: Fig. 5-1, but do not connect LINE IN (R), and engage 1-kHz filter. • Set the deck to record mode. Find the difference between the 1-kHz recorded portion (L-ch) and the "no signal" portion (R-ch).				
	BIAS, EQ: Co(CrO ₂) Tape: MTT-5061	LINE IN: L-ch 1 kHz/−9 dB (275 mV) R-ch No signal	Check	OUTPUT: 35 dB min. ratio	

ITEM	SETTING	INPUT SIGNAL	ADJUST (or CHECK)	MEASURING POINT: RESULT	REMARKS
21. Adjacent track crosstalk	● Connection: Fig. 5-1, but do not connect LINE IN (L) and OUTPUT (L). ● Record a 125-Hz signal on R-ch and note output level. Invert tape and play R-ch track. Check leakage level against the output reference of previously recorded portion.				
	BIAS, EQ: Co(CrO ₂) Tape: MTT-5061	LINE IN: L-ch No signal R-ch 125 Hz/−9 dB (275 mV)	Check	OUTPUT: 40 dB min. ratio	
22. DOLBY NR effect	● Record a 1-kHz signal with NR SYSTEM switch OUT. Play this portion with NR SYSTEM switch set to OUT and set to NR. Obtain the difference in output level between OUT and NR positions. Repeat the above process using a 10-kHz signal.				
	BIAS, EQ: Co(CrO ₂) Tape: MTT-5061	LINE IN: 1 kHz/−29 dB (27.5 mV)	Check	OUTPUT: Variation 3 dB to 8 dB	
	BIAS, EQ: Co(CrO ₂) Tape: MTT-5061	LINE IN: 10 kHz/−39 dB (8.69 mV)	Check	OUTPUT: Variation 8 dB to 12 dB	
23. Dolby HX effect	(1) BIAS, EQ: NORMAL Tape: MTT-501 NR SYSTEM: NR	LINE IN: Required signal/ −42 dB (6.15 mV)	Check	OUTPUT: Fig. 5-12	
	(2) NR SYSTEM: NR + HX	LINE IN: Required signal/ −42 dB (6.15 mV)	R36 (for L- and R-channels)	OUTPUT: Fig. 5-12	
	(3) NR SYSTEM: NR + HX	LINE IN: Required signal/ −12 dB (195 mV)	Check	OUTPUT: Fig. 5-13	
	(4) NR SYSTEM: OUT	LINE IN: Required signal/ −12 dB (195 mV)	Check	OUTPUT: At 10 kHz to 12.5 kHz, should be lower than measured in step (3).	
	(5) BIAS, EQ: Co(CrO ₂) Tape: MTT-5061	Repeat steps (1) to (4), but substitute R37 for R36.			
24. BIAS/REC CALIBRATION (on front panel)	BIAS, EQ: Co(CrO ₂) Tape: MTT-5061 INPUT: TEST ADJUST/PRE-SET sw.: ADJUST R35/R45 trim-pot: fully CCW (↺) R30/R40 trim-pot: fully CW (↻)				
	Record-pause mode MONITOR sw.: SOURCE	LINE IN: 1 kHz/−29 dB (27.5 mV)	RECORD cont's (L/R)	OUTPUT: −25 dB (43.6 mV)	
	Record-pause mode MONITOR sw.: SOURCE	LINE IN: 1 kHz/−29 dB (27.5 mV)	Check	PEAK LEVEL meter: 0 dB ±2 dB	
	Record-play mode MONITOR sw.: TAPE	LINE IN: 1 kHz/−29 dB (27.5 mV)	While rotating R35/R45 trim-pots clock- wise, check that the difference in OUTPUT level between the setting where a maximum output value is obtained and when the trim-pot is set fully clockwise is more than 4 dB.		R35/R45 variable range checks
	Record-play mode MONITOR sw.: TAPE	LINE IN: 1 kHz/−29 dB (27.5 mV)	Set R35/R45 in the position correspond- ing to maximum output value. Check that, when R30/R40 is rotated from fully CW position to fully CCW position, OUTPUT level is reduced by more than 10 dB.		R30/R40 variable range checks
	Record-play mode MONITOR sw.: TAPE SOURCE	LINE IN: 400 Hz/−29 dB (27.5 mV)	R30/R40	OUTPUT: Equal level with MONITOR switch, TAPE and SOURCE	
	Record-play mode MONITOR sw.: TAPE	LINE IN: 400 Hz/−29 dB 6.3 kHz/−29 dB 12.5 kHz/−29 dB	R35/R45	OUTPUT: Flat level between all 3 signals	

5.4 ADJUSTMENT AND TEST POINT LOCATIONS

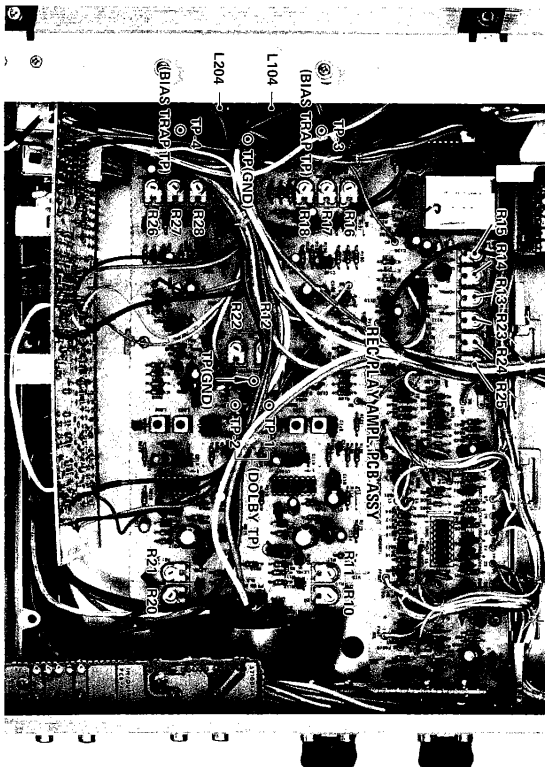


Fig. 5-6

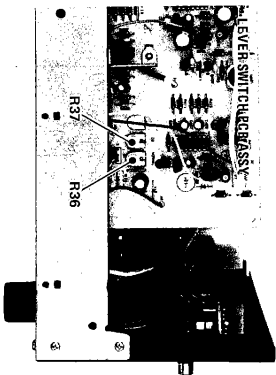


Fig. 5-7

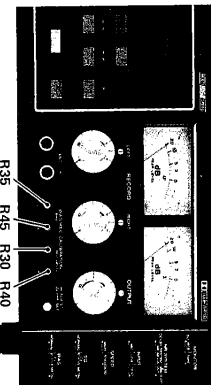


Fig. 5-8

	R10/R20	Playback EQ
	R11/R21	PEAK LEVEL meter
	R12/R22	Record bias (NORMAL)
	R13/R23	Record bias (Co(CrO ₂))
	R14/R24	Record bias (METAL)
	R15/R25	Record level (METAL)
	R16/R26	Record level (Co(CrO ₂))
	R17/R27	Record level (NORMAL)
	R18/R28	Record level (coarse-adjusted for general setting)
	R30/R40	Record bias (coarse-adjusted for general setting)
	R35/R45	DOLBY HX effect (NORMAL)
	R36	DOLBY HX effect (Co(CrO ₂))
	R37	Bias trap
	L104/L204	

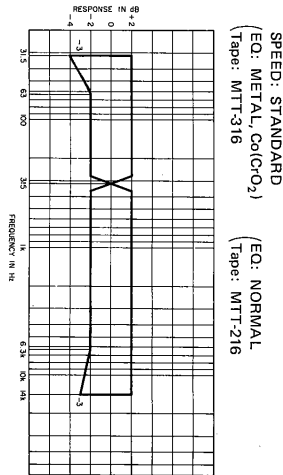


Fig. 5-9 Playback frequency response

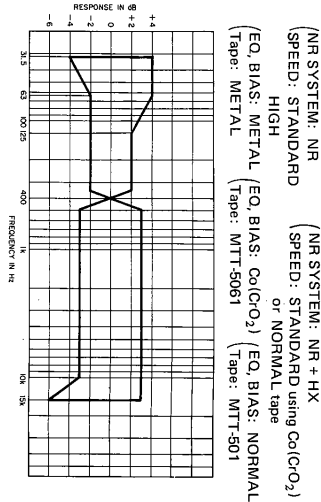


Fig. 5-12 Overall frequency response (Dolby IN)

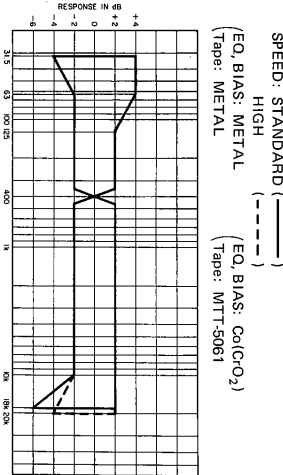


Fig. 5-10 Overall frequency response (METAL, Co(CrO₂))

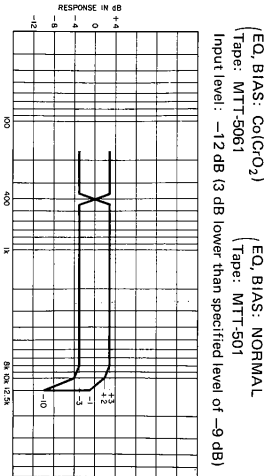


Fig. 5-13 Dolby HX effect

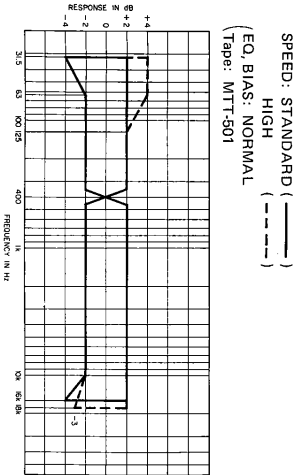
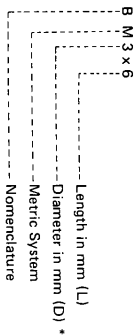


Fig. 5-11 Overall frequency response (NORMAL)

ASSEMBLING HARDWARE CODING LIST

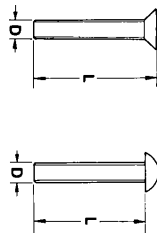
All screws conform to ISO standards, and have crossrecessed heads, unless otherwise noted.
ISO screws have the head inscribed with a point as in the figure to the right.

FOR EXAMPLE:



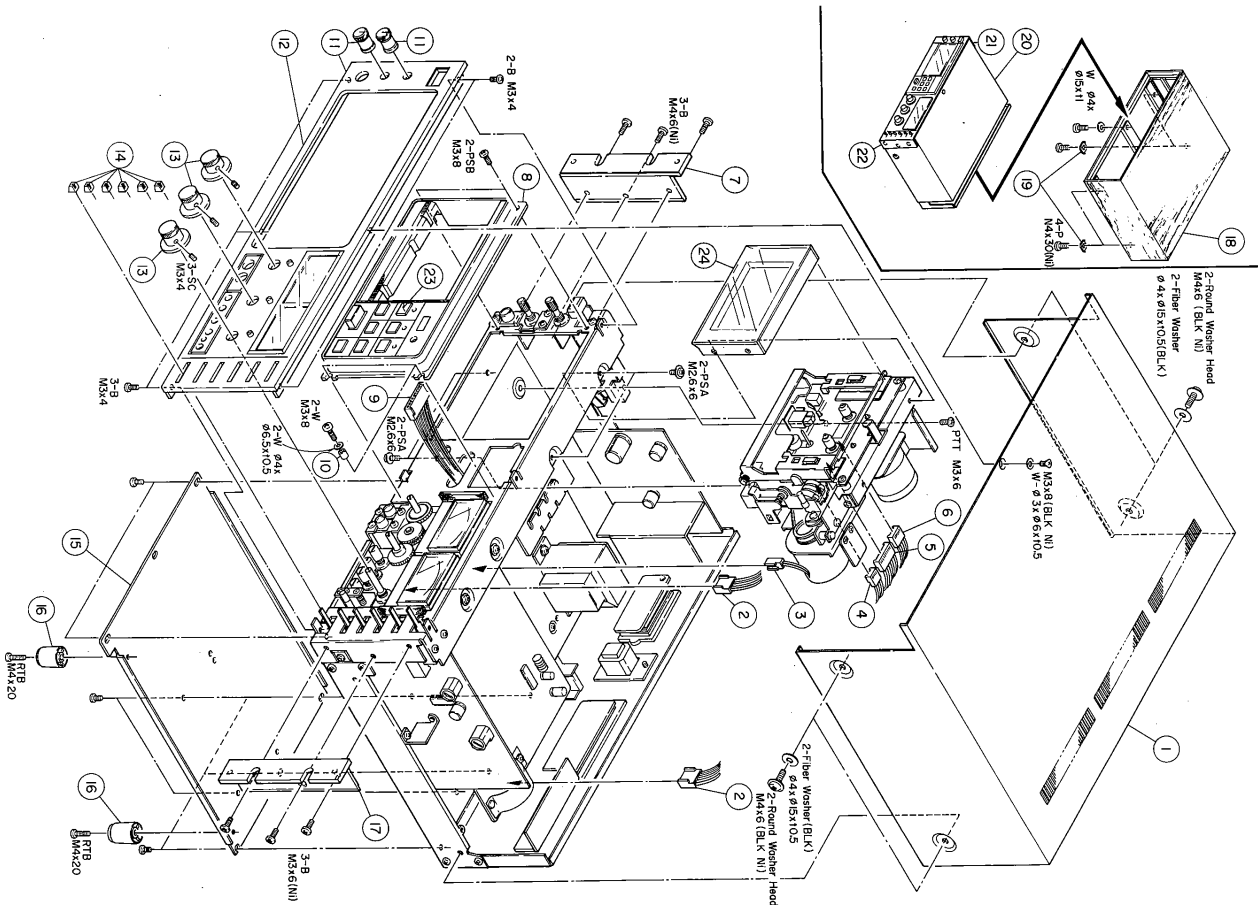
* Inner dia. for washers and nuts

	Code	Name	Type		Code	Name	Type
MACHINE SCREW	R	Round Head Screw		TAPPING SCREW	BTA	Binding Head Tapping Screw(A Type)	
	P	Pan Head Screw			BTB	Binding Head Tapping Screw(B Type)	
	T	Stove Head Screw (Truss)			RTA	Round Head Tapping Screw(A Type)	
	B	Binding Head Screw			RTB	Round Head Tapping Screw(B Type)	
	F	Flat Countersunk Head Screw		SETSCREW	SF	Hex Socket Setscrew(Flat Point)	
WOOD SCREW	O	Oval Countersunk Head Screw			SC	Hex Socket Setscrew(Cup Point)	
	RW	Round Head Wood Screw			SS	Slotted Socket Setscrew(Flat Point)	
	PTT	Pan Head Taprite Screw			E	E-Ring (Retaining Washer)	
	WTT	Washer Head Taprite Screw			W	Flat Washer (Plain)	
SEMS SCREW	BSA	Binding Head SEMS Screw(A Type)		WASHER	SW	Lock Washer (Spring)	
	BSB	Binding Head SEMS Screw(B Type)			LWI	Lock Washer (Internal Teeth)	
	BSF	Binding Head SEMS Screw(F Type)			LWE	Lock Washer (External Teeth)	
	PSA	Pan Head SEMS Screw(A Type)			TW	Trim Washer (Countersunk)	
	PSB	Pan Head SEMS Screw(B Type)			N	Hex Nut	



6 EXPLODED VIEWS AND PARTS LIST

EXPLODED VIEW - 1



Parts marked with *require longer delivery time than regular parts.

EXPLODED VIEW - 1

REF. NO.	PARTS NO.	DESCRIPTION
1 - 1	*5800060300	Cover, Top [All except L]
1 - 2	*5122168000	Connector, Socket; 6P
1 - 3	*5122165000	Connector, Socket; 3P
1 - 4	*5122166000	Connector, Socket; 4P
1 - 5	*5122172000	Connector, Socket; 10P
1 - 6	*5122167000	Connector, Socket; 5P
1 - 7	*5800059400	Bracket, Handle; L [All except L]
1 - 8	*5800083400	Escutcheon Assy, Cassette
1 - 9	*5122174000	Connector, Socket; 12P
1 - 10	*5785603025	Spacer
1 - 11	5504712000	Knob Assy, TIMER
1 - 12	*5640007300	Panel Assy, Front
1 - 13	5543027100	Knob, VR
1 - 14	5534521000	Knob, Lever Switch
1 - 15	*5552340201	Chassis, Rear [All except L]
	*5502229001	Chassis Assy, Rear [L]
1 - 16	*5504676000	Foot [All except L]
1 - 17	*5800059500	Bracket, Handle; R [All except L]
1 - 18	*5800064800	Cabinet Assy [L]
1 - 19	*5555526000	Washer [L]
1 - 20	*5800060400	Cover, Top; Shield [L]
1 - 21	*5800059800	Sash, Side; L [L]
1 - 22	*5800059900	Sash, Side; R [L]
1 - 23	5138009000	Key Unit
1 - 24	5503187000	Cover Assy, Cassette

INCLUDED ACCESSORIES

REF. NO.	PARTS NO.	DESCRIPTION
	5128065000	Cord Assy, Input-output Connection
	5101345000	Information Supplement, Cassette [U]
	5101495000	Information Supplement, Cassette [All except U]
	5740005000	Plate Assy, Side; B [All except L]
	5544995000	Washer x 4 [All except L]
	5534659000	Spacer x 4 [All except L]
	5780215015	Screw, M5 x 15 (Ni) x 4 [All except L]
	5564682000	Seal, MEMORY [All except L]
	5700007200	C-3X Owner's Manual [U]
	5700007300	C-3X Owner's Manual [All except U]

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Parts marked with *require longer delivery time than regular parts.

EXPLODED VIEW - 2

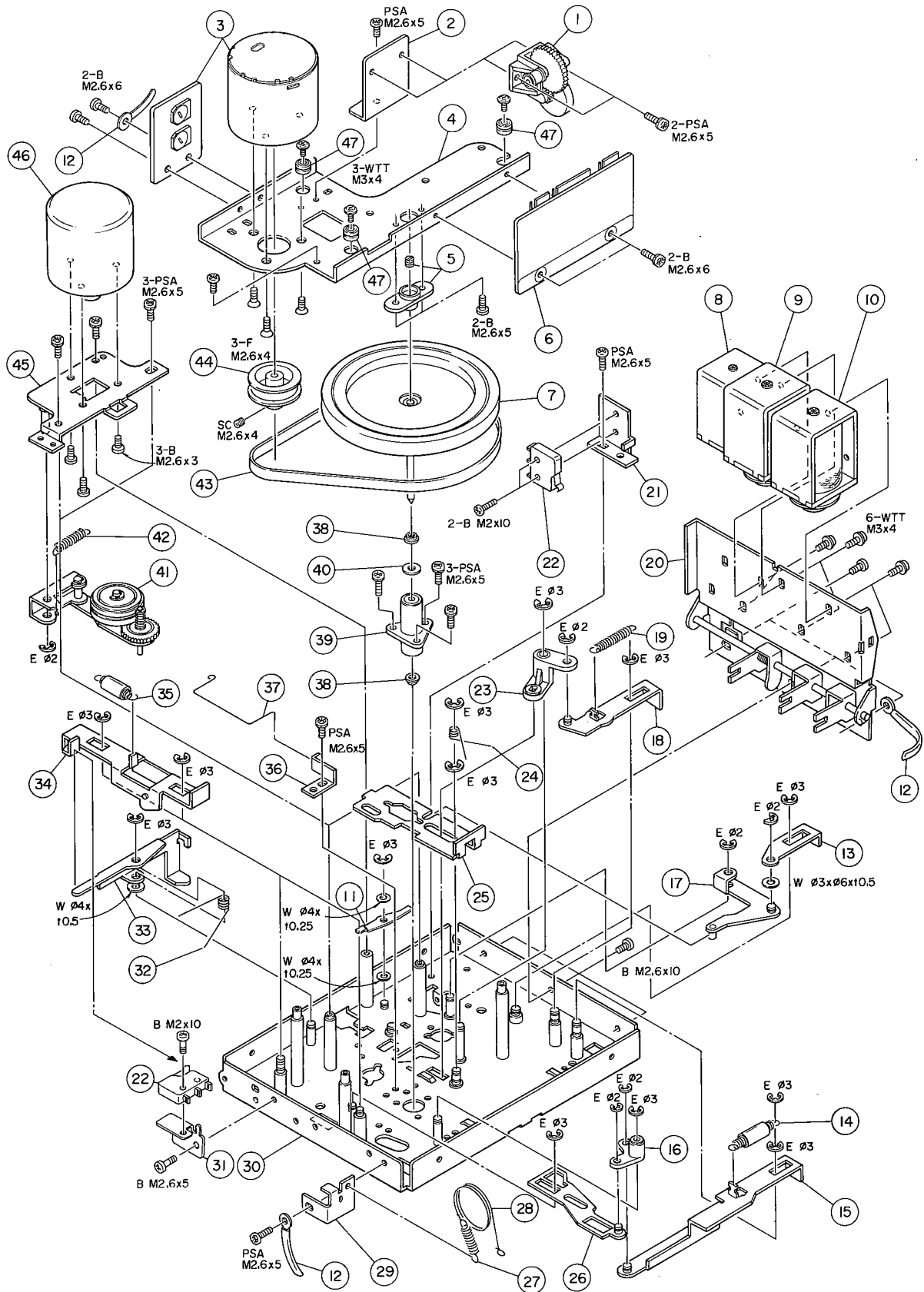
REF. NO.	PARTS NO.	DESCRIPTION
2 - 1	*5553285000	Holder, Cassette
2 - 2	*5544958000	Shaft, Lock Plate
2 - 3	*5534612000	Plate, Lock
2 - 4	*5534613000	Guide, Cassette; L
2 - 5	*5555655000	Plate, Cassette Holder
2 - 6	*5534615000	Spring, Cassette Pressure
2 - 7	*5555582000	Tape, Adhesive
2 - 8	*5534638000	Lens, Lamp
2 - 9	*5534844000	Shoe, Brake
2 - 10	*5520333000	Spring, Brake
2 - 11	*5504669002	Plate Assy, Brake; B
2 - 12	*5210010200	PCB, LAMP [U]
	*5210022400	PCB, LAMP [All except U]
2 - 13	5142026000	Lamp, DC 6V 65mA
2 - 14	*5544656000	Shaft, Lever
2 - 15	*5555544000	Lever, Record Preventing; D
2 - 16	*5524197000	Spring, Lever
2 - 17	*5555535000	Bracket, Counter Assy
2 - 18	5504660001	Counter Assy
2 - 19	5534617000	Belt, Counter
2 - 20	*5534448000	Mounting Rubber
2 - 21	*5200018410	PCB Assy, REED SW [All except U]
	*5200018400	PCB Assy, REED SW [U]
2 - 22	*5534444200	Guide, Cassette
2 - 23	*5524201000	Spring, Eject Arm
2 - 24	*5555551000	Arm, Eject
2 - 25	*5800090600	Holder Assy, Switch
2 - 26	*5800098500	Cushion, Reel
2 - 27	*5555552000	Arm, Eject Actuating
2 - 28	5800063800	Pulley Assy, Reel; R
2 - 29	*5581055000	Screw, Shoulder
2 - 30	5800063700	Pulley Assy, Reel; L
2 - 31	*5555549000	Arm, Eject Preventing
2 - 32	*5524200000	Spring, Arm
2 - 33	*5534606000	Arm, Pinch Roller
2 - 34	5504828001	Arm Assy, Pinch Roller
2 - 35	*5800060100	Chassis Assy, Mechanism
2 - 36	*5524285000	Spring, Pinch Roller
2 - 37	*5555531000	Plate, Head Base; B
2 - 38	*5555530000	Plate, Head Base; A
2 - 39	*5504717000	Plate Assy, Head Base
2 - 40	*5581062000	Clamper, Cord; E
2 - 41	5540055000	Steel Ball, $\phi 2$
2 - 42	*5555533000	Plate, Pressure
2 - 43	*5800064400	Spacer, Erase Head
2 - 44	5569613000	Head, Erase
2 - 45	5524141000	Spring, Height Adj.
2 - 46	*5524208000	Spring, Tension
2 - 47	*5533174000	Arm, Tension
2 - 48	5540056000	Steel Ball, $\phi 3$
2 - 49	5800063300	Table Assy, Reel; R
2 - 50	5800063200	Table Assy, Reel; L
2 - 51	5534683100	Guide, Cassette; L
2 - 52	*5504716000	Plate Assy, Head Mounting
2 - 53	*5555658000	Plate, Tension Adj.
2 - 54	5569606100	Head, REC-PLAY
2 - 55	5534614000	Guide, Cassette; R
2 - 56	*5504714000	Bracket Assy, Holder; L
2 - 57	*5504715000	Bracket Assy, Holder; R
2 - 58	*5524202000	Spring, Holder

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EXPLODED VIEW - 3



Parts marked with *require longer delivery time than regular parts.

EXPLODED VIEW - 3

REF. NO.	PARTS NO.	DESCRIPTION
3 - 1	*5504673000	Holder Assy, Damper; C
3 - 2	*5555555000	Bracket, Damper
3 - 3	5370000600	Motor Assy, Capstan; DC
3 - 4	*5800064600	Plate, Flywheel Base
3 - 5	*5534277000	Bearing, Flywheel
3 - 6	*5200014100	PCB Assy, JOINT [U]
	*5200014110	PCB Assy, JOINT [All except U]
3 - 7	5504757000	Flywheel Assy, Capstan
3 - 8	5163040000	Solenoid, B
3 - 9	5163039100	Solenoid, A
3 - 10	5313000500	Solenoid
3 - 11	*5555546000	Arm, Pressure; B
3 - 12	*5581038000	Clamper, Cord; A
3 - 13	*5800062600	Lever, Actuating
3 - 14	*5524195000	Spring, Lever
3 - 15	*5504666000	Lever Assy, Pause Actuating
3 - 16	*5534611000	Arm, Pause Actuating
3 - 17	*5800061900	Arm Assy, Actuating
3 - 18	*5504665000	Lever Assy, Actuating
3 - 19	*5524213000	Spring, Actuating; A
3 - 20	*5800065500	Bracket Assy, Solenoid; B
3 - 21	*5555543000	Bracket, Switch
3 - 22	5130003000	Switch, Micro
3 - 23	*5534610000	Arm, Base Actuating
3 - 24	*5800062700	Spring, Pulley Guide
3 - 25	*5800062900	Plate, Pulley Guide
3 - 26	*5504667000	Lever Assy, Pause
3 - 27	*5524203000	Spring, Damper
3 - 28	*5788202100	String, Damper
3 - 29	*5555556000	Angle, Spring
3 - 30	*5800060100	Chassis Assy, Mechanism
3 - 31	*5800062300	Bracket, Switch
3 - 32	*5800062800	Spring, Cassette Pressure
3 - 33	*5800061600	Arm, Cassette Pressure
3 - 34	*5504670000	Lever Assy, Eject
3 - 35	*5524199000	Spring, Eject
3 - 36	*5800063000	Guide, Actuating Bar
3 - 37	*5800062500	Bar, Brake Actuating
3 - 38	*5534130000	Washer, Oil Retaining
3 - 39	*5504091000	Housing Assy, Capstan
3 - 40	*5550031000	Washer Thrust
3 - 41	5504808000	Pulley Assy, Fast Wind
3 - 42	*5524274000	Spring, Arm
3 - 43	5800063100	Belt, Capstan Drive
3 - 44	5800062400	Pulley, Motor
3 - 45	*5504807001	Plate Assy, Motor
3 - 46	7105135000	Motor Assy, Reel; DC
3 - 47	*5534537000	Collar, Rubber

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Parts marked with *require longer delivery time than regular parts.

EXPLODED VIEW - 4

REF. NO.	PARTS NO.	DESCRIPTION
4 - 1	△5128034000	Cord, AC Power [GE, L]
	△5128075000	Cord, AC Power [U, C]
	△5128017000	Cord, AC Power [E]
	△5128036000	Cord, AC Power [UK]
	△5350008300	Cord, AC Power [A]
4 - 2	*5534660000	Strain Relief, AC Power Cord [All except UK]
	*5534661000	Strain Relief, AC Power Cord [UK]
4 - 3	5534118000	Rivet, Push
4 - 4	*5552381000	Panel, Rear
4 - 5	*5555063000	Washer, GND
4 - 6	*5330505000	Plug, 2P; Shorting
4 - 7	*5800088000	Cover, Shield
4 - 8	*5122225000	Connector, Socket; 6P (BLK)
4 - 9	*5122282000	Connector, Socket; 4P (RED)
4 - 10	*5122166000	Connector, Socket; 4P (WHT)
4 - 11	*5122167000	Connector, Socket; 5P (WHT)
4 - 12	*5200013400	PCB Assy, IN/OUTPUT [U]
	*5200013410	PCB Assy, IN/OUTPUT [All except U]
4 - 13	*5200013300	PCB Assy, IN/OUTPUT (DBX) [U]
	*5200013310	PCB Assy, IN/OUTPUT (DBX) [All except U]
4 - 14	*5200013500	PCB Assy, REMOTE [U]
	*5200013510	PCB Assy, REMOTE [All except U]
4 - 15	*5620013700	Socket Assy, 6P
4 - 16	*5581038000	Clamper, Cord; A
4 - 17	*5122169000	Connector, Socket; 7P (WHT)
4 - 18	*5200013100	PCB Assy, REC-PLAY AMPL [U]
	*5200013110	PCB Assy, REC-PLAY AMPL [All except U]
4 - 19	*5122165000	Connector, Socket; 3P (WHT)
4 - 20	*5122284000	Connector, Socket; 6P (RED)
4 - 21	*5555565200	Angle, PCB
4 - 22	*5122223000	Connector, Socket; 4P (BLK)
4 - 23	*5122164000	Connector, Socket; 2P (WHT)
4 - 24	△5134018000	Switch, Power [U, C]
	△5134011000	Switch, Power [E, UK, A]
	△5134009000	Switch, Power [GE, L]
4 - 25	△5052906000	Spark Killer, 0.033 μ F + 120 Ω /250V [U]
	△5052907000	Spark Killer, 0.01 μ F + 300 Ω /400V [GE, L]
	△5052911000	Spark Killer, 0.033 μ F + 120 Ω /250V [C]
	△5267702500	Spark Killer, 0.0047 μ F/250V [E, UK, A]
4 - 26	*5555561000	Bracket, Power Switch
4 - 27	*5122168000	Connector, Socket; 6P (WHT)
4 - 28	*5200013201	PCB Assy, MIC JACK [U]
	*5200013210	PCB Assy, MIC JACK [All except U]
4 - 29	5150223000	Var. Res., 100k Ω (A)
4 - 30	*5553269101	Chassis, L
4 - 31	5282406302	Var. Res., 20k Ω x 2 (A)
4 - 32	*5300019500	Switch, Push; 6-2
4 - 33	*5200013900	PCB Assy, SW [U]
	*5200013910	PCB Assy, SW [All except U]
4 - 34	5282250201	Var. Res., 250k Ω (B)
4 - 35	5282250101	Var. Res., 50k Ω (B)
4 - 36	5504713000	Knob, Push Switch; K
4 - 37	*5800059300	Bracket, SW PCB
4 - 38	*5555646000	Bracket, Lever Switch

REF. NO.	PARTS NO.	DESCRIPTION
4 - 39	*5555913000	Mask, C
4 - 40	*5524082000	Spring, LED; B
4 - 41	*5168899000	PCB Assy, LED
4 - 42	*5504568000	Gear Assy, A
4 - 43	*5504710001	Bracket, Var. Res.
4 - 44	*5504569200	Gear Assy, Friction
4 - 45	*5555912000	Mask, B
4 - 46	*5554653200	Bracket, Meter
4 - 47	5165053100	Meter, Peak Level
4 - 48	*5524124000	Spring, GND
4 - 49	*5800064900	Chassis, Front
4 - 50	*5800059200	Bracket, Switch
4 - 51	5124022000	Jack, PHONES
4 - 52	*5200013700	PCB Assy, SW (MEMORY) [U]
	*5200013710	PCB Assy, SW (MEMORY) [All except U]
4 - 53	5133019000	Switch, Rotary; 2-3
4 - 54	5534431000	Button, B
4 - 55	*5534422100	Rod, Power Switch
4 - 56	*5786360500	R Pin, ϕ 5
4 - 57	*5200013600	PCB Assy, SW (TIMER) [U]
	*5200013610	PCB Assy, SW (TIMER) [All except U]
4 - 58	*5504676000	Foot
4 - 59	*5551031200	Chassis, R [All except L]
	*5502228000	Chassis Assy, R [L]
4 - 60	*5200014002	PCB Assy, POWER SUPPLY [U]
	*5200014012	PCB Assy, POWER SUPPLY [All except U]
4 - 61	*5555951001	Heat Sink
4 - 62	*5033291000	Plate, Insulating
4 - 63	5231755100	Transistor, 2SD880Y
4 - 64	*5317000300	Plate, Insulating
4 - 65	5231755500	Transistor, 2SD985
4 - 66	*5033295000	Tube, Insulating
4 - 67	*5553353100	Bracket, Transformer
4 - 68	*5555060000	Bracket, B [GE, L]
4 - 69	*5168548100	PCB Assy, VOLTAGE SELECTOR [GE, L]
4 - 70	△5152182100	Transformer, Power [U, C]
	△5152184000	Transformer, Power [E, UK, A]
	△5152215000	Transformer, Power [GE, L]
4 - 71	*5555626000	Washer, Transformer
4 - 72	*5168973200	PCB Assy, FUSE [E, UK, A]

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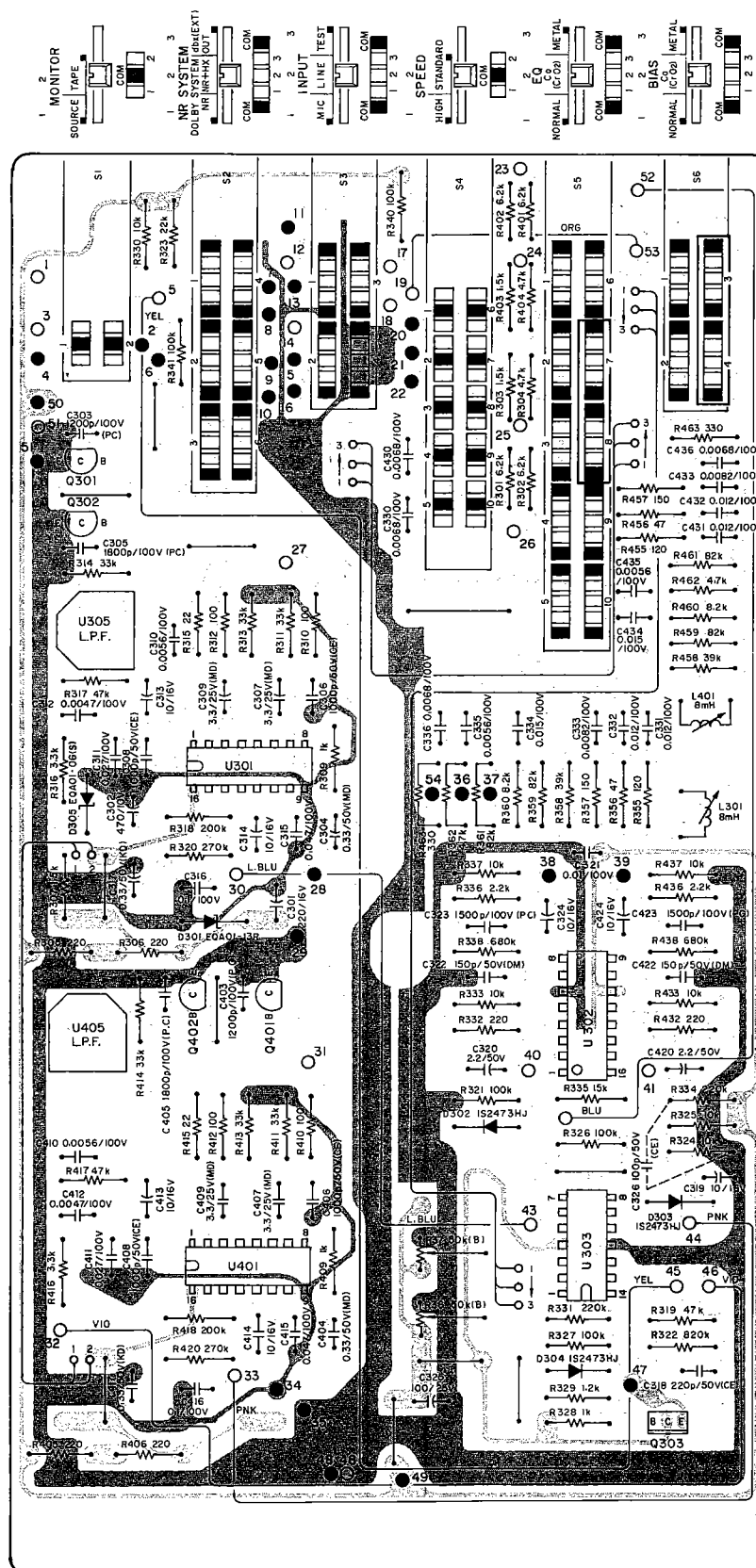
[C]: CANADA
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7 PC BOARDS AND PARTS LIST

PC Boards shown viewed from foil side

LEVER SWITCH PCB ASSY



REC-PLAY AMPL PCB ASSY

REF. NO.	PARTS NO.	DESCRIPTION
	5200013100	PCB Assy [U]
	5200013110	PCB Assy [All except U]
	5210013100	PCB [U]
	5210021200	PCB [All except U]
IC's		
U101, U201	5147040000	NE645B
U102	5147074000	LA4170
U104	5147024000	JRC4558DF
U601	5147047000	M54410P
TRANSISTORS		
Q101, Q201	5145119000	2SC1844F
Q102, Q202	5042461000	2SC1327T
Q103, Q203	5145185000	2SD655E
Q104, Q204	5145086000	2SC1636-2
Q105, Q205	5042461000	2SC1327T
Q106, Q206	5145178000	2SC1684S
Q107, Q207	5145183000	FET, 2SK68AMI
Q108, Q208	5145086000	2SC1636-2
Q109, Q209	5145110000	2SC1637-1
Q110	5145132000	2SA933LNS
Q111	5145178000	2SC1684S
Q112	5145132000	2SA933LNS
Q113	5145178000	2SC1684S
Q114	5145082000	2SC2060Q
Q115	5145178000	2SC1684S
Q116, Q216	5145185000	2SD655E
Q117, Q217	5145178000	2SC1684S
Q118, Q218	5145132000	2SA933LNS
Q601, Q602	5230770700	2SC1841E
Q603, Q604	5145091000	2SC945AK
Q605	5230770700	2SC1841E
Q606 ~ Q609	5145091000	2SC945AK
Q610	5042553000	2SA733P
Q611 ~ Q614	5145091000	2SC945AK
DIODES		
D101, D201	5143198000	Zener, EQA01-13RF
D102, D202	5143118000	1S2473HJ
D601 ~ D604	5224012510	1S2076
D605	5143143000	Zener, RD4.3E
D606 ~ D608	5224012510	1S2076
D609	5143143000	Zener, RD4.3E
D610	5224012510	1S2076
CARBON RESISTORS		
All resistors are rated $\pm 5\%$ tolerance and $\frac{1}{4}$ watt.		
R101, R201	5183126000	68k Ω
R102, R202	5183122000	47k Ω
R103, R203	5183034000	10 Ω
R104, R204	5183058000	100 Ω
R105, R205	5183118000	33k Ω
R106, R206	5183098000	4.7k Ω
R107, R207	5183140000	270k Ω
R108, R208	5183072000	390 Ω
R109, R209	5183098000	4.7k Ω
R110, R210	5183082000	1k Ω
R111, R211	5183104000	8.2k Ω
R112, R212	5183114000	22k Ω
R113, R213	5183130000	100k Ω
R114, R214	5183094000	3.3k Ω
R115, R215	5183094000	3.3k Ω

REF. NO.	PARTS NO.	DESCRIPTION
R116, R216	5183064000	180 Ω
R117, R217	5183064000	180 Ω
R118, R218	5183082000	1k Ω
R119, R219	5183118000	33k Ω
R120, R220	5183058000	100 Ω
R121, R221	5183118000	33k Ω
R122, R222	5183042000	22 Ω
R123, R223	5183094000	3.3k Ω
R124, R224	5183122000	47k Ω
R125, R225	5183137000	200k Ω
R126, R226	5183140000	270k Ω
R127, R227	5183066000	220 Ω
R128, R228	5183082000	1k Ω
R129, R229	5183130000	100k Ω
R130, R230	5183112000	18k Ω
R131, R231	5183048000	39 Ω
R132	5184225000	10 Ω , Non Flammable
R133, R233	5183082000	1k Ω
R134, R234	5183128000	82k Ω
R135, R235	5183120000	39k Ω
R136, R236	5183150000	680k Ω
R137, R237	5183098000	4.7k Ω
R138, R238	5183106000	10k Ω
R139, R239	5183082000	1k Ω
R140, R240	5183038000	15 Ω
R141, R241	5183096000	3.9k Ω
R142, R242	5183114000	22k Ω
R143, R243	5183082000	1k Ω
R144, R244	5183146000	470k Ω
R145, R245	5184249000	100 Ω , Non Flammable
R146, R246	5183110000	15k Ω
R147	5183106000	10k Ω
R148 ~ R151	5183130000	100k Ω
R152	5183128000	82k Ω
R153	5183098000	4.7k Ω
R154	5183114000	22k Ω
R155	5183130000	100k Ω
R156	5183110000	15k Ω
R157	5183106000	10k Ω
R158	5183098000	4.7k Ω
R159	5183114000	22k Ω
R160	5183010000	1 Ω
R161	5183086000	1.5k Ω
R162	5183110000	15k Ω
R163, R263	5183126000	68k Ω
R164, R264	5183118000	33k Ω
R165, R265	5183122000	47k Ω
R166, R266	5183106000	10k Ω
R167, R267	5183138000	220k Ω
R168, R268	5183104000	8.2k Ω
R169, R269	5183130000	100k Ω
R170, R270	5183058000	100 Ω
R171, R271	5183094000	3.3k Ω
R172, R272	5183122000	47k Ω
R173, R273	5183118000	33k Ω
R174, R274	5183090000	2.2k Ω
R175, R275	5183118000	33k Ω
R176, R276	5183096000	3.9k Ω
R177, R277	5183122000	47k Ω
R178, R278	5183122000	47k Ω
R179, R279	5183114000	22k Ω
R180, R280	5183098000	4.7k Ω
R181, R281	5183108000	12k Ω

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REF. NO.	PARTS NO.	DESCRIPTION
R182, R183	5183106000	10k Ω
R184, R284	5183096000	3.9k Ω
R185, R285	5183114000	22k Ω
R186, R286	5183128000	82k Ω
R187, R287	5183106000	10k Ω
R188	5183084000	1.2k Ω
R189, R289	5183106000	10k Ω
R190, R290	5183114000	22k Ω
R191, R291	5183106000	10k Ω
R192, R292	5183106000	10k Ω
R193, R293	5183108000	12k Ω
R194, R294	5183106000	10k Ω
R195, R295	5183108000	12k Ω
R196, R296	5183134000	150k Ω
R197	5183098000	4.7k Ω
R601 ~ R607	5183046000	33 Ω
R608	5183118000	33k Ω
R609	5183026000	4.7 Ω
R610	5183110000	15k Ω
R611	5183118000	33k Ω
R612 ~ R614	5183112000	18k Ω
R616, R617	5183110000	15k Ω
R618, R619	5183106000	10k Ω
R620	5183112000	18k Ω
R621	5183074000	470 Ω
R622, R623	5183112000	18k Ω
R624	5183110000	15k Ω
R626	5183086000	1.5k Ω
R627	5183106000	10k Ω
R628	5183074000	470 Ω
R629	5183110000	15k Ω
R630, R631	5183062000	150 Ω
R632	5183110000	15k Ω
R633, R634	5183086000	1.5k Ω
R639	5183118000	33k Ω
R640	5183062000	150 Ω
R641	5183100000	5.6k Ω
R642	5183092000	2.7k Ω
R643	5183116000	27k Ω
R644	5183062000	150 Ω
R645	5183116000	27k Ω
R646	5183100000	5.6k Ω
R647	5183078000	680 Ω
R648 ~ R650	5183104000	8.2k Ω
R651	5183086000	1.5k Ω
R652	5183074000	470 Ω
R653, R654	5183106000	10k Ω
R655	5183086000	1.5k Ω
R656, R657	5183110000	15k Ω
R658	5183086000	1.5k Ω
R659	5183110000	15k Ω
R660	5183112000	18k Ω
R661	5183100000	5.6k Ω
R662	5183046000	33 Ω
CAPACITORS		
C101, C201	5173027800	Elec. 47 μ F 6.3V
C102, C202	5171684000	Dip. Tant. 15 μ F 6.3V
C103, C203	5173587800	Elec. 47 μ F 6.3V
C104, C204	5170425000	Mylar 0.01 μ F 100V 5%
C105, C205	5172304000	Ceramic 22pF 50V 10%
C106, C206	5173552800	Elec. 0.22 μ F 50V
C107, C207	5170409000	Mylar 0.0022 μ F 100V 5%

REF. NO.	PARTS NO.	DESCRIPTION
C108, C208	5170401000	Mylar 0.001 μ F 100V 5%
C109, C209	5173054800	Elec. 220 μ F 16V
C110, C210	5173053800	Elec. 220 μ F 10V
C111, C211	5173552800	Elec. 0.22 μ F 50V
C112, C212	5170407000	Mylar 0.0018 μ F 100V
C113, C213	5054745000	Dip. Mica 220pF 50V 10%
C114, C214	5172324000	Ceramic 0.001 μ F 50V 10%
C115, C215	5173561800	Elec. 3.3 μ F 25V
C116, C216	5172324000	Ceramic 0.001 μ F 50V 10%
C117, C217	5170419000	Mylar 0.0056 μ F 100V 5%
C118, C218	5170435000	Mylar 0.027 μ F 100V 5%
C119, C219	5170417000	Mylar 0.0047 μ F 100V 5%
C120, C220	5173010800	Elec. 10 μ F 16V
C121, C221	5173010800	Elec. 10 μ F 16V
C122, C222	5170441000	Mylar 0.047 μ F 100V 5%
C123, C223	5170449000	Mylar 0.1 μ F 100V 5%
C124, C224	5260225812	Elec. 0.33 μ F 50V 10%
C125, C225	5173556800	Elec. 1 μ F 50V
C126	5173010800	Elec. 10 μ F 16V
C127, C227	5173010800	Elec. 10 μ F 16V
C128	5173054800	Elec. 220 μ F 16V
C129, C229	5173044800	Elec. 100 μ F 10V
C130, C230	5173005800	Elec. 4.7 μ F 35V
C131, C231	5173005800	Elec. 4.7 μ F 35V
C132, C232	5173550800	Elec. 0.1 μ F 50V
C133, C233	5173019800	Elec. 22 μ F 25V
C134, C234	5173037800	Elec. 47 μ F 25V
C135	5173507800	Elec. 47 μ F 6.3V
C136	5173560800	Elec. 2.2 μ F 50V
C137	5173554800	Elec. 0.47 μ F 50V
C138	5173560800	Elec. 2.2 μ F 50V
C139, C239	5170455000	Mylar 0.18 μ F 100V 5%
C140, C240	5173729000	Polypro. 560pF 100V 5%
C141, C241	5173554800	Elec. 0.47 μ F 50V
C142, C242	5173052800	Elec. 220 μ F 6.3V
C143, C243	5173481800	Elec. 3.3 μ F 25V
C144, C244	5173731000	Polypro. 820pF 100V 5%
C145, C245	5173728000	Polypro. 470pF 100V 5%
C146, C246	5173010800	Elec. 10 μ F 16V
C147	5173010800	Elec. 10 μ F 16V
C148, C248	5173734000	Polypro. 0.0015 μ F 100V 5%
C149, C249	5173010800	Elec. 10 μ F 16V
C150, C250	5173010800	Elec. 10 μ F 16V
C151, C251	5170411000	Mylar 0.0027 μ F 100V 5%
C152	5173550800	Elec. 0.1 μ F 50V
C153	5172344000	Ceramic 0.047 μ F 50V 10%
C154, C254	5173010800	Elec. 10 μ F 16V
C601 ~ C605	5172336000	Ceramic 0.01 μ F 50V 10%
C606	5173010800	Elec. 10 μ F 16V
C607	5172336000	Ceramic 0.01 μ F 50V 10%
C608	5054230000	Ceramic 0.047 μ F 50V 10%
C609	5173027800	Elec. 33 μ F 16V
C610	5173053800	Elec. 220 μ F 10V
C611	5172992800	Elec. 1 μ F 50V
C612	5173035800	Elec. 47 μ F 10V
THERMISTORS		
RT10, RT20	5143127000	S5C14
RT11, RT21	5143127000	S5C14
VARIABLE RESISTORS		
R10, R20	5280004002	Semi-fixed 50k Ω (B)
R11, R21	5280004002	Semi-fixed 50k Ω (B)

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POWER SUPPLY PCB ASSY

REF. NO.	PARTS NO.	DESCRIPTION
R12, R22	5280004002	Semi-fixed 50k Ω (B)
R13, R23	5280004302	Semi-fixed 200k Ω (B)
R14, R24	5280004202	Semi-fixed 100k Ω (B)
R15, R25	5280004202	Semi-fixed 100k Ω (B)
R16, R26	5280004002	Semi-fixed 50k Ω (B)
R17, R27	5280004002	Semi-fixed 50k Ω (B)
R18, R28	5280004002	Semi-fixed 50k Ω (B)
COILS		
L101, L201	5160107000	Choke, 1200 μ H
L102, L202	5286001100	Choke, 38mH
L103, L203	5286001200	Trap, 12mH
L104, L204	5286001000	Choke, 3.1mH; Variable
L105	5160151000	Choke, 1.2mH
MISCELLANEOUS		
U103	5292200300	OSC Unit, 100kHz
P1	5122126000	Connector Plug, 2P (WHT)
P2	5122130000	Connector Plug, 6P (WHT)
P3	5122127000	Connector Plug, 3P (WHT)
P4	5122128000	Connector Plug, 4P (WHT)
P5	5122301000	Connector Plug, 4P (RED)
P6	5122303000	Connector Plug, 6P (RED)
P7	5122187000	Connector Plug, 6P (BLK)
P8	5122130000	Connector Plug, 6P (WHT)
P9	5122185000	Connector Plug, 4P (BLK)
P10	5122127000	Connector Plug, 3P (WHT)
P11	5122131000	Connector Plug, 7P (WHT)

REF. NO.	PARTS NO.	DESCRIPTION
	5200014001	PCB Assy [U]
	5200014011	PCB Assy [All except U]
	5210014001	PCB [U]
	5210022101	PCB [All except U]
TRANSISTORS		
Q501, Q502	5231755500	2SD985
Q503, Q504	5145085000	2SA934R
Q505	5231755100	2SD880Y
Q506	5145091000	2SC945AK
Q507	5231755500	2SD985
Q508	5042553000	2SA733P
Q509, Q510	5230505300	2SB750
Q511	5230770700	2SC1841E
Q512, Q513	5231755500	2SD985
Q514, Q515	5230505300	2SB750
Q516	5230770700	2SC1841E
Q517	5231755100	2SD880Y
Q518	5230505300	2SB750
Q519 ~ Q521	5145091000	2SC945AK
Q522	5042553000	2SA733P
DIODES		
D501, D502	5224012510	1S2076
D503	5224013210	DS135D
D504, D505	5224012510	1S2076
D506	5224013210	DS135D
D507 ~ D511	5224012510	1S2076
D512	5143059000	Zener, RD13EB
D513, D514	5224012510	1S2076
D515 ~ D517	5224013210	DS135D
D518, D519	5143153000	Zener, EQA01-06R
D521	5224012510	1S2076
D531 ~ D534	5224013210	DS135D
D541 ~ D544	5224013210	DS135D
CARBON RESISTORS		
All resistors are rated $\pm 5\%$ tolerance and $\frac{1}{4}$ watt.		
R501	5183112000	18k Ω
R502	5183086000	1.5k Ω
R503	5183094000	3.3k Ω
R504	5183142000	330k Ω
R505	5183100000	5.6k Ω
R506	5183142000	330k Ω
R507	5183094000	3.3k Ω
R508	5183112000	18k Ω
R509	5183076000	560 Ω
R510	5183074000	470 Ω
R511	5183110000	15k Ω
R512	5183104000	8.2k Ω
R513	5183098000	4.7k Ω
R514	5183086000	1.5k Ω
R515	5183090000	2.2k Ω
R516, R517	5183110000	15k Ω
R518	5183114000	22k Ω
R519	5183086000	1.5k Ω
R520, R521	5183106000	10k Ω
R522, R523	5183096000	3.9k Ω
R524	5183106000	10k Ω
R525	5183110000	15k Ω
R526	5183102000	6.8k Ω
R527	5183092000	2.7k Ω
R528	5183110000	15k Ω

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REF. NO.	PARTS NO.	DESCRIPTION
R529	5183086000	1.5k Ω
R530	5183090000	2.2k Ω
R531	5183110000	15k Ω
R532 ~ R534	5183106000	10k Ω
R535	5183096000	3.9k Ω
R536	5183106000	10k Ω
R537	5183110000	15k Ω
R538	5183096000	3.9k Ω
R539	5183106000	10k Ω
R540	5183090000	2.2k Ω
R541, R542	5183098000	4.7k Ω
R543	5183090000	2.2k Ω
R544	5183102000	6.8k Ω
R545	5183110000	15k Ω
R546	5184233000	22 Ω , Non Flammable
R547	5183102000	6.8k Ω
R548, R549	5183130000	100k Ω
R550	5183104000	8.2k Ω
R551	5183106000	10k Ω
R552	5183066000	220 Ω
R553	5183136000	180k Ω
R554	5183106000	10k Ω
R555	5183112000	18k Ω
R556	5184225000	10 Ω , Non Flammable
R557	5183110000	15k Ω
R559	5183310000	5.6k Ω
CAPACITORS		
C501, C502	5054230000	Ceramic 0.047 μ F 50V 10%
C503	5173072800	Elec. 470 μ F 16V
C504	5173053800	Elec. 220 μ F 10V
C505	5173045800	Elec. 100 μ F 16V
C506	5173082800	Elec. 1000 μ F 25V
C507	5173010800	Elec. 10 μ F 16V
C508	5173006800	Elec. 4.7 μ F 50V
C509	5173044800	Elec. 100 μ F 10V
C510	5173035800	Elec. 47 μ F 10V
C511	5173072800	Elec. 470 μ F 16V
C512	5173036800	Elec. 47 μ F 16V
C513	5173084800	Elec. 1000 μ F 50V
C514	5173082800	Elec. 1000 μ F 50V
C515	5173013800	Elec. 10 μ F 50V
C516	5173006800	Elec. 4.7 μ F 50V
C517	5173073800	Elec. 470 μ F 25V
C518	5173048800	Elec. 100 μ F 50V
C519	5172992800	Elec. 1 μ F 50V
C520	5173084800	Elec. 1000 μ F 50V
C521	5173588800	Elec. 47 μ F 10V
C522	5172992800	Elec. 1 μ F 50V
C523	5173053800	Elec. 220 μ F 10V
C524	5173071800	Elec. 470 μ F 10V
C525	5173044800	Elec. 100 μ F 10V
C526	5173028800	Elec. 33 μ F 25V
C527	5173084800	Elec. 1000 μ F 50V

MIC JACK PCB ASSY

REF. NO.	PARTS NO.	DESCRIPTION
	5200013200	PCB Assy [U]
	5200013210	PCB Assy [All except U]
	5210013200	PCB [U]
	5210021300	PCB [All except U]
TRANSISTORS		
Q310, Q410	5145119000	2SC1844F
CARBON RESISTORS		
All resistors are rated $\pm 5\%$ tolerance, $\frac{1}{4}$ watt.		
R370, R470	5183130000	100k Ω
R371, R471	5183114000	22k Ω
R372, R472	5183146000	470k Ω
R373, R473	5183034000	10 Ω
R374, R474	5183050000	47 Ω
R375, R475	5183070000	330 Ω
R376, R476	5183108000	12k Ω
R377	5183082000	1k Ω
R378, R478	5183130000	100k Ω
CAPACITORS		
C370, C470	5173037800	Elec. 47 μ F 25V
C371, C471	5173571800	Elec. 10 μ F 16V
C372, C472	5172316000	Ceramic 220pF 50V 10%
C373, C473	5173044800	Elec. 100 μ F 10V
C374, C474	5173564800	Elec. 4.7 μ F 25V
MISCELLANEOUS		
J9	5122149000	Connector Plug, 6P

JOINT PCB ASSY

REF. NO.	PARTS NO.	DESCRIPTION
	5200014100	PCB Assy [U]
	5200014110	PCB Assy [All except U]
	5210014100	PCB [U]
	5210022300	PCB [All except U]
TRANSISTOR		
Q692	5230772100	2SC2270A-B
DIODES		
D693 ~ D695	5224013210	DS135D
CARBON RESISTORS		
R693	5183076000	560 Ω 5% $\frac{1}{4}$ W
R694	5183038000	15 Ω 5% $\frac{1}{4}$ W
CAPACITORS		
C691, C692	5173010800	Elec. 10 μ F 16V
	5172324000	Ceramic 0.001 μ F 50V 10%
MISCELLANEOUS		
P691	5122163000	Connector Plug, 10P (WHT)
P692	5122148000	Connector Plug, 5P (WHT)
P693	5122147000	Connector Plug, 4P (WHT)

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**IN/OUTPUT TERMINAL PCB ASSY (DBX)
(PC Board Omitted)**

REF. NO.	PARTS NO.	DESCRIPTION
	5200013300	PCB Assy [U]
	5200013310	PCB Assy [All except U]
	5210013300	PCB [U]
	5210021400	PCB [All except U]
R365, R465	5183118000	Resistor, Carbon 33k Ω 5% $\frac{1}{4}$ W

REMOTE CONNECTOR PCB ASSY (PC Board Omitted)

REF. NO.	PARTS NO.	DESCRIPTION
	5200013500	PCB Assy [U]
	5200013510	PCB Assy [All except U]
	5210013500	PCB [U]
	5210021600	PCB [All except U]
	5122336000	Connector Socket, 12P

IN/OUTPUT TERMINAL PCB ASSY (PC Board Omitted)

REF. NO.	PARTS NO.	DESCRIPTION
	5200013400	PCB Assy [U]
	5200013410	PCB Assy [All except U]
	5210013400	PCB [U]
	5210021500	PCB [All except U]
R379, R479 P13	5183120000	Resistor, Carbon 39k Ω 5% $\frac{1}{4}$ W
	5122129000	Connector Plug, 5P (WHT)

REED SWITCH PCB ASSY (PC Board Omitted)

REF. NO.	PARTS NO.	DESCRIPTION
	5200018400	PCB Assy [U]
	5200018410	PCB Assy [All except U]
	5210018400	PCB [U]
	5210022500	PCB [All except U]
S693 C693	5138006000	Switch, Reed.
	5054802400	Capacitor, Mylar 0.01 μ F 100V 10%

SWITCH PCB ASSY (MEMORY) (PC Board Omitted)

REF. NO.	PARTS NO.	DESCRIPTION
	5200013700	PCB Assy (Memory) [U]
	5200013710	PCB Assy (Memory) [All except U]
	5210013700	PCB (Memory) [U]
	5210021800	PCB (Memory) [All except U]
Q691	5145981000	Transistor, 2SC945AK
R691	5183086000	Resistor, Carbon 1.5k Ω 5% $\frac{1}{4}$ W
R692	5183076000	Resistor, Carbon 560 Ω 5% $\frac{1}{4}$ W
S691	5133019000	Switch, Rotary; 2-3

SWITCH PCB ASSY (TIMER) (PC Board Omitted)

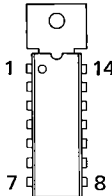
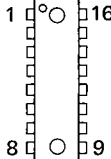
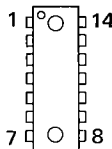
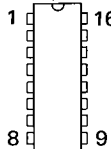
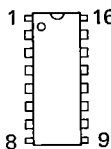
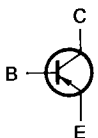
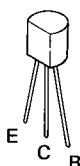
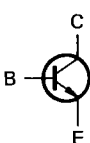
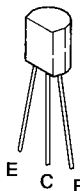
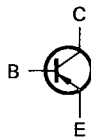
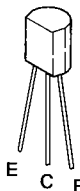
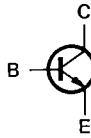
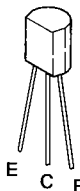
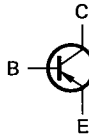
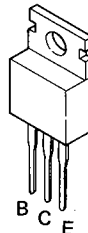
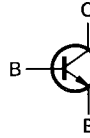
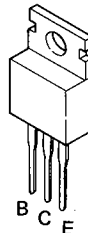
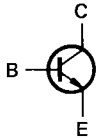
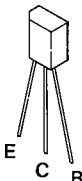
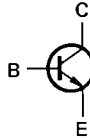
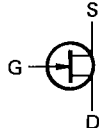
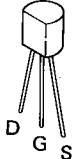
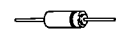
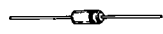
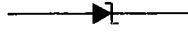
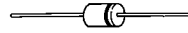
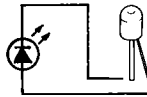
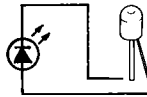
REF. NO.	PARTS NO.	DESCRIPTION
	5200013600	PCB Assy (Timer) [U]
	5200013610	PCB Assy (Timer) [All except U]
	5210013600	PCB (Timer) [U]
	5210021700	PCB (Timer) [All except U]
D691, D692 S692	5224012510	Diode, 1S2076
	5133019000	Switch, Rotary; 2-3

[U]: U.S.A.
[A]: AUSTRALIA
[L]: LIMITED AREA

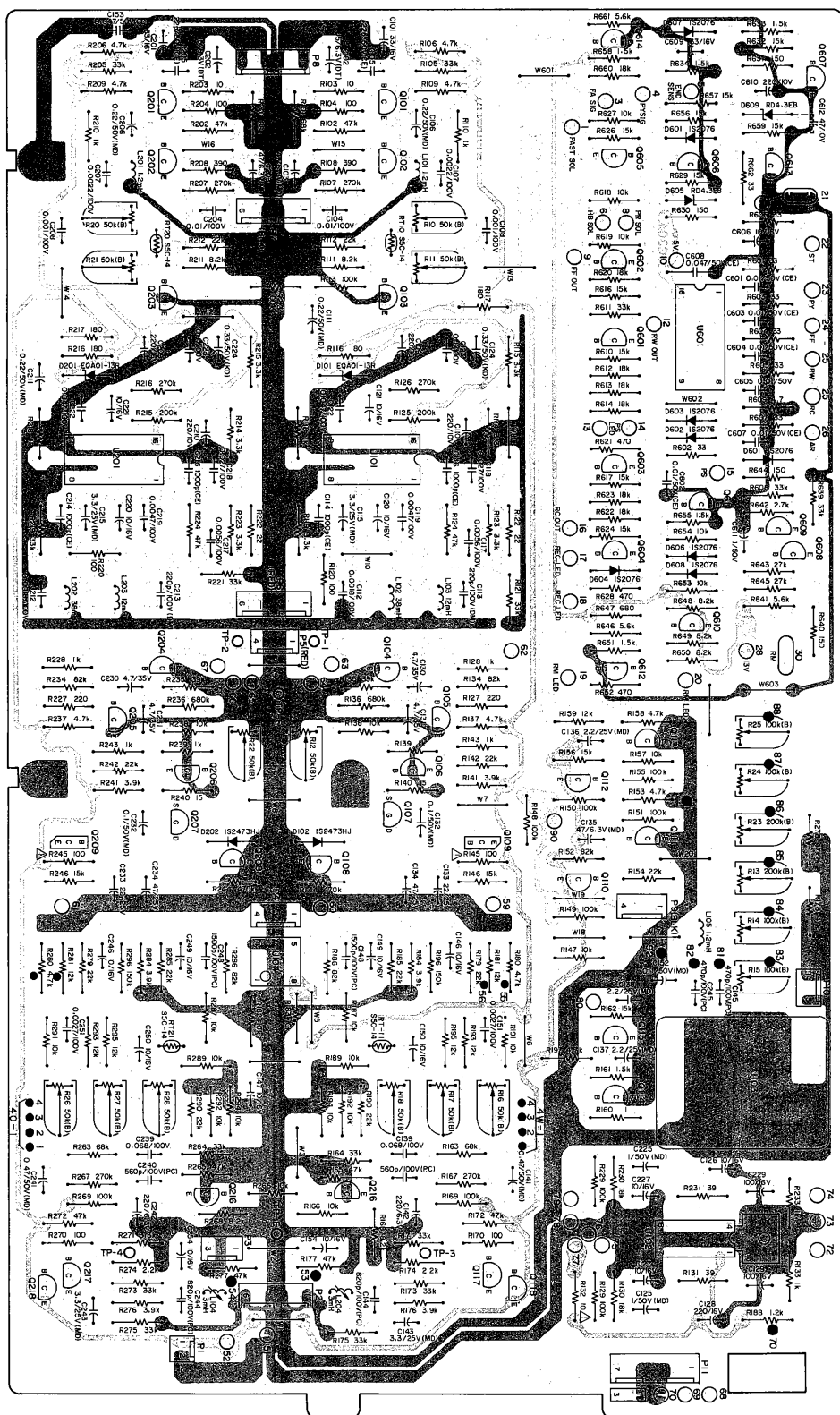
[C]: CANADA
[E]: EUROPE

[GE]: GENERAL EXPORT
[UK]: U.K.

TABLE OF SEMICONDUCTORS

JRC4558DF (TOP VIEW)	LA4170 (TOP VIEW)	LM13600 (TOP VIEW)	LM324 (TOP VIEW)	M54410P (TOP VIEW)	NE645B (TOP VIEW)
					
2SA733P 2SA933LNS	2SC1327T 2SC1684S 2SC1841E 2SC1844F 2SC945AK 2SD655E	2SA934R	2SC2060Q	2SB750	2SD880Y
 	 	 	 	 	 
2SC1636-2 2SC1637-1	2SC2270A-B 2SD985	2SK68AM1	1S2076 1S2473HJ	DS135D	RD4.3EB RD13EB
 	 	 	 	 	 
			EQA01-06R EQA01-06S EQA01-13RF	SLP-114B	
			 	 	

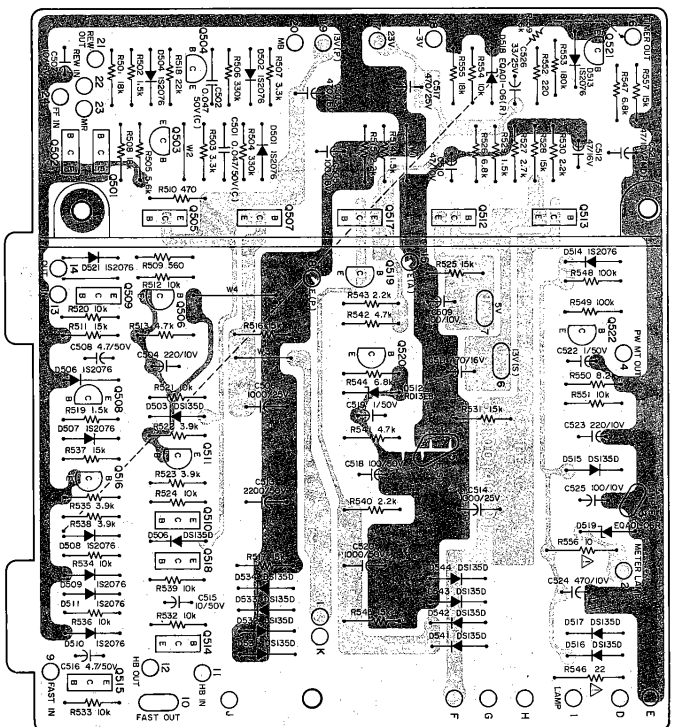
REC/PLAY AMPL PCB ASSY



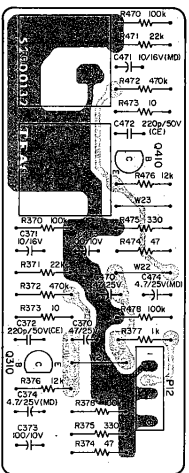
NOTES

1. PC Boards shown viewed from foil side.
2. The colors used on the PCB illustrations have the following significance:
 — +B power supply circuit
 — B power supply circuit
 — GND
3. Resistor values are in ohms (K = 1,000 ohms).
4. All capacitor values are in microfarads (p = picofarads).

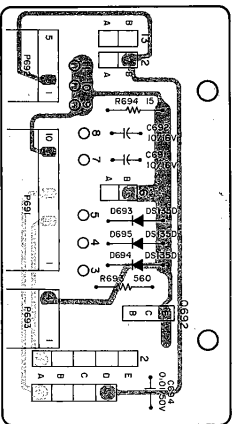
POWER SUPPLY PCB ASSY



MIC JACK PCB ASSY



JOINT PCB ASSY



LEVER SWITCH PCB ASSY

REF. NO. PARTS NO. DESCRIPTION

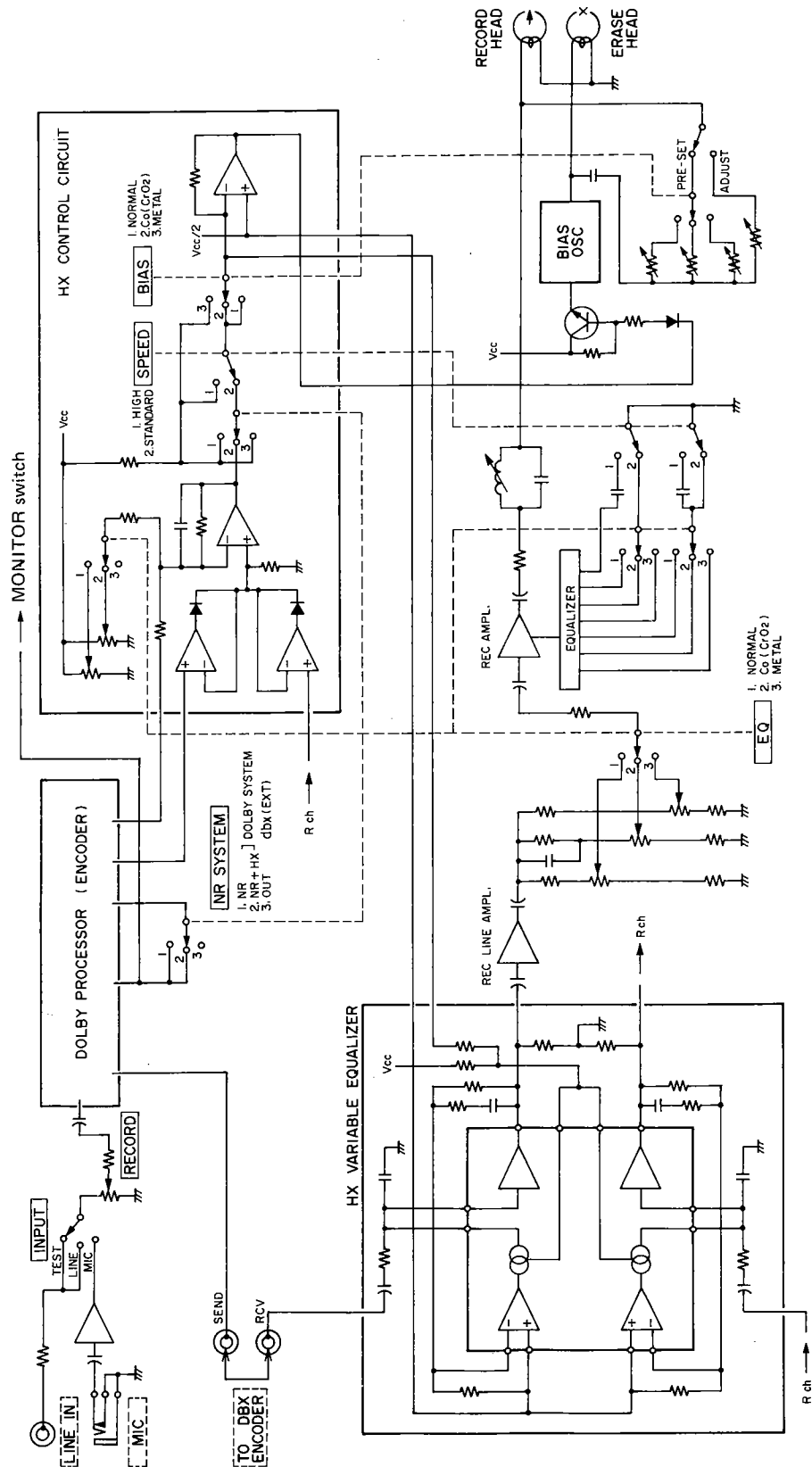
U301, U401	5174040000	NE645B
U302	5220405200	LM13600
U303	5220405300	LM1324
TRANSISTORS		
Q301, Q401	5145617800	2SC1684S
Q302, Q402	5145617800	2SC1684S
Q303	5231755500	2SD985
DIODES		
D301	5143198000	Zener, EQA01-13R
D302 ~ D304	5143118000	1S2473HJ
D305	5143184000	Zener, EQA01-06S
CARBON RESISTORS		
All resistors are rated $\pm 5\%$ tolerance and $\frac{1}{4}$ watt.		
R301, R401	5183101000	6.2k Ω
R302, R402	5183101000	6.2k Ω
R303, R403	5183086000	1.5k Ω
R304, R404	5183086000	4.7k Ω
R305, R405	5183066000	220 Ω
R306	5183066000	220 Ω
R307	5183086000	1.5k Ω
R308, R408	5183082000	1k Ω
R309, R409	5183082000	100 Ω
R310, R410	5183082000	33k Ω
R311, R411	5183118000	33k Ω
R312, R412	5183056000	100 Ω
R313, R413	5183118000	33k Ω
R314, R414	5183118000	33k Ω
R315, R415	5183042000	22 Ω
R316, R416	5183094000	3.3k Ω
R317, R417	5183122000	47k Ω
R318, R418	5173136000	200k Ω
R319, R419	5183122000	47k Ω
R320, R420	5183140000	270k Ω
R321	5183130000	100k Ω
R322	5183152000	820k Ω
R323	5183114000	22k Ω
R324, R325	5183106000	10k Ω
R326, R327	5183130000	100k Ω
R328	5183082000	1k Ω
R329	5183084000	1.2k Ω
R330	5183096000	4.7k Ω
R331	5183138000	22k Ω
R332, R432	5183138000	220 Ω
R333, R433	5183106000	10k Ω
R334	5183138000	220k Ω
R335	5183110000	15k Ω
R336, R436	5183090000	2.2k Ω
R337, R437	5183106000	10k Ω
R338, R438	5183150000	680k Ω
R340, R440	5183130000	100k Ω
R345, R445	5183060000	120 Ω
R356, R456	5183050000	47 Ω
R357, R457	5183062000	150 Ω

REF. NO. PARTS NO. DESCRIPTION

R358, R458	5183120000	39k Ω
R359, R459	5183128000	82k Ω
R360, R460	5183104000	8.2k Ω
R361, R461	5183128000	82k Ω
R362, R462	5183098000	4.7k Ω
R363, R463	5183070000	330 Ω
CAPACITORS		
C301	5173054800	220 μ F
C302	517271800	470 μ F
C303	5172732000	100 μ F
C304, C404	5172653800	0.0012 μ F
C305, C405	5173735000	0.0018 μ F
C306, C406	5172324000	0.001 μ F
C307, C407	51723561800	3.3 μ F
C308, C408	5172324000	0.001 μ F
C309, C409	51723561800	3.3 μ F
C310, C410	5170419000	0.0056 μ F
C311, C411	5170435000	0.0027 μ F
C312, C412	5170417000	0.0047 μ F
C313, C413	5173010800	10 μ F
C314, C414	5173010800	10 μ F
C315, C415	5170441000	0.047 μ F
C316, C416	5170449000	0.1 μ F
C317, C417	5260225812	0.33 μ F
C318	5172316000	220 μ F
C319	5173010800	10 μ F
C320, C420	5172966800	2.2 μ F
C321	5170426000	0.01 μ F
C322, C422	5054326000	150 μ F
C323, C423	5173734000	0.0015 μ F
C324, C424	5173010800	10 μ F
C325	5173046800	100 μ F
C326	5172312000	100 μ F
C330, C430	5170421000	0.0068 μ F
C331, C431	5170427000	0.012 μ F
C332, C432	5170427000	0.012 μ F
C333, C433	5170423000	0.0082 μ F
C334, C434	5170428000	0.015 μ F
C335, C435	5170418000	0.0086 μ F
C336, C436	5170421000	0.0086 μ F
VARIABLE RESISTORS		
R36, R37	5280004002	Semi-fixed 50k Ω (B)
COILS		
L301, L401	5286000040	Choke, 8mH; Variable
SWITCHES		
S1	5300510200	Lever, 2-2
S2	5300510700	Lever, 6-3
S3	5300510600	Lever, 4-3
S4	5300511500	Lever, 10-2
S5	5300511600	Lever, 10-3
S6	5300510600	Lever, 4-3
MISCELLANEOUS		
U305, U405	5292802600	Filter, Low-pass

[U]: U.S.A.
[A]: AUSTRALIA
[L]: LIMITED AREA[C]: CANADA
[E]: EUROPE[GE]: GENERAL EXPORT
[UK]: U.K.

BLOCK DIAGRAM



C-3X

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