ONKYO SERVICE MANUAL

OM 3261

STEREO CASSETTE TAPE DECK MODEL TA-2140

Black models

UDN, UDC, UD	120V AC, 60Hz
UG	220V AC, 50Hz
UW	120 or 220V AC, 50/60Hz
UQA, UQB	240V AC, 50Hz

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PARTS NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

ONKYO®
AUDIO COMPONENTS

SPECIFICATIONS

Track System:	4-tracks, 2-channels
Erasing System:	AC erase
Tape Speed:	4.8 cm/sec (1-7/8 i.p.s.)
Wow and Flutter:	0.06% (WRMS)
Frequency Response:	20—15,000Hz (Normal) (30—14,000Hz ±3dB) 20—16,000Hz (High) (30—15,000Hz ±3dB) 20—17,000Hz (Metal) (30—16,000Hz ±3dB)
S/N Ratio:	Dolby NR off: 58dB (metal position tape) A noise reduction of 10dB above 5kHz and 5dB at 1kHz is possible with Dolby B NR. A noise reduction of 20dB at 5kHz is possible with Dolby C NR.
Input Jacks:	Microphone jacks: 2 Input sensitivity: 0.6mV/600 ohms Input impedance: 2.7 kohms Line IN: 2 Input sensitivity: 60mV Input impedance: 50 kohms
Outputs:	Line OUT: 2 Standard output level: 500mV (0dB) Optimum load impedance: over 50 kohms
Motors:	DC servo motor x 1; DC motor x 1
Heads:	REC/PB: Special Hard Permalloy x 1; Erase head: Ferrite x 1
Power Supply:	AC 120V, 60Hz
Power Consumption:	20 watts
Dimensions:	435(W) x 112(H) x 262(D)mm (17-1/8" x 4-3/8" x 10-3/8")

Weight: 4.1 kg. (9.1 lbs.)

Specifications and external appearance are subject to change without notice because of product improvements.

SERVICE PROCEDURES

1. Replacing the lamp

This unit used the lamp listed below.

Circuit No.	Parts No.	Description
PL901	210090	PL14V 150mA

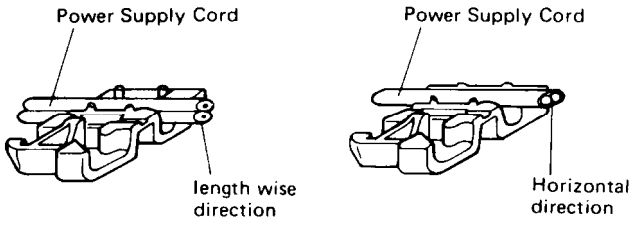
Caution: Before replacing the lamp. Be sure to unplug the power supply cable.

2. Instruction resistance measurement

Connect the insulating-resistance tester between the plug of power supply cord and chassis.
Specifications; 500V more than 10MΩ

3. Replacement of power supply cord

There are two power supply cord outlets on the strainrelief. Insert them in prescribed direction to ensure safety. AS-UC-3 (UD<120V> model) should be inserted lengthwise and other types of cords should be inserted horizontally.



4. Method for removing BOTTOM BOARD (refer to exploded view of chassis)

1. Remove top cover.
2. Remove front panel.
3. Remove the 2 mounting screws of the main PC board (NAAF-2947-1).
4. Remove the 2 holders from the PC board.
5. Remove the 1 fastening screw of the Power Switch PC board (NAPS-2951-1).
6. Remove the holder from the PC board.
7. Remove the 4 fastening screws of the back panel and bottom board.
8. Remove the 3 fastening screws of the front bracket and bottom board.
9. Remove the ground terminal.
10. Remove the bottom board by taking from the lower direction.

5. Mechanism operation

This mechanism consists of a capstan motor, reel motor, and solenoid, with the power assist method by means of the capstan motor. In the operation, there are 3 conditions: STOP, PLAY, and CUE/REV. When the position is triggered by the solenoid, by means of intermittent rotation of the gear from the flywheel, as shown in Fig. 1, cyclic shifting is done.

To go from STOP to PLAY, if the solenoid is pulled in for 30ms, after about 150ms there is a shift to the PLAY condition. From this condition, if the solenoid is again pulled in, in that interval the condition shifts to CUE/REV. However, to suppress heat generation in the solenoid, the supply voltage must be reduced. If the power to the solenoid is cut off, the head lowers, and the condition goes to STOP. In order to have a cyclic operation as stated above, and to know the existing condition, a play switch is provided, and this switch is ON for PLAY and OFF for STOP (CUE/REV) is indefinite. When power is turned ON, the mechanism makes use of an initializer.

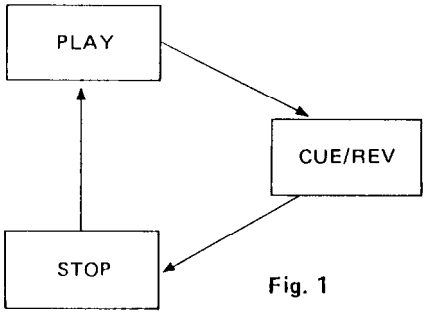
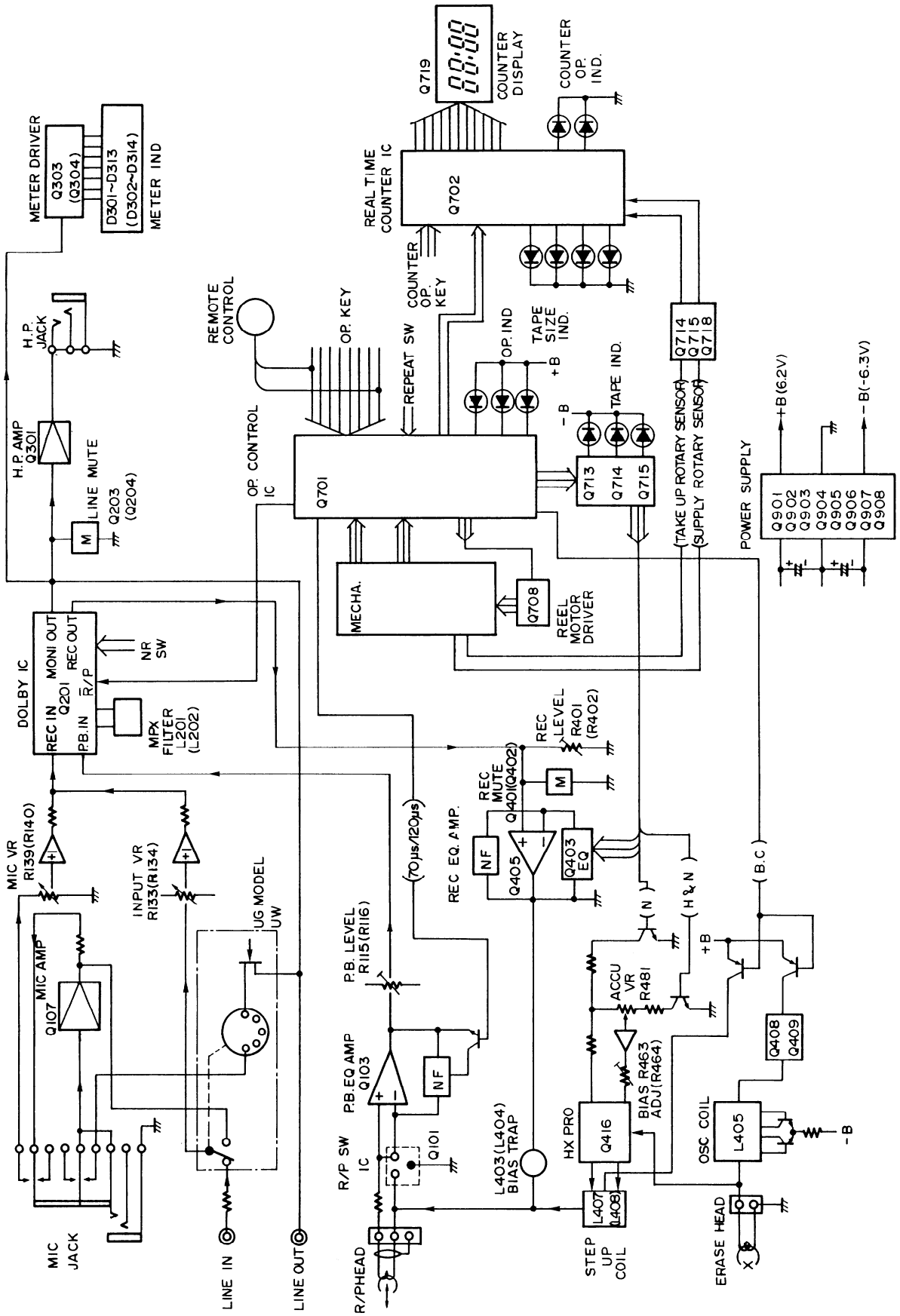


Fig. 1

BLOCK DIAGRAM



ADJUSTMENT PROCEDURES

PRECAUTIONS

1. Before adjustment, clean the following parts with an alchol moinstend swab.
   * record/playback head
   * erase head
   * pinch roller
   * capstan
2. Do not use magnetized screwdriver for adjustments.
3. Demagnetize record/playback head with a head demagnetizer.

TEST EQUIPMENT/TOOLS REQUIRED:

Audio oscillator
Digital frequency counter
Oscilloscope
Attenuator
AC voltmeter
Non-magnetic screw driver
Blank tapes (completely erased)
NORMAL . . . . . NEW UD90
HIGH . . . . . NEW XL-II90
METAL . . . . . NEW MX60
Test tapes
VTT-658 : 10 KHz, −15dB
MTT-111 : 3 kHz, −10dB
MTT-150 : Dolby level calibration 400Hz, tone 200nWb/m

Item		Connection of instrument	Line input	Test tape	Mode	Output indicator	Adjustment point	Adjust	Remarks
1	Tape speed	Frequency counter to LINE output terminal		MTT-111	PB	Frequency counter	Semi-fixed on the motor	3,010 to 3,020Hz	
2	Head azimuth	AC voltmeter and oscilloscope to LINE output terminal		VTT-658	PB	AC voltmeter	Head azimuth screw	Maximum and same phase at channels L and R	
3	Playback level	AC voltmeter to terminals TP-1 and TP-2		MTT-150	PB	AC voltmeter	R-115(Ch.L) R-116(Ch.R)	245mV	
4	Bias frequency	Frequency counter to P401. E head read (loose coupling)		METAL TAPE	REC	Frequency counter	L-405	85kHz	
5	HX-PRO	AC voltmeter to terminals TP-3 and TP-4		METAL TAPE	REC	AC voltmeter	L-407(Ch.L) L-408(Ch.R)	Maximum	
6	Bias current	AC voltmeter to LINE output terminal	1kHz, −20dB and 12kHz, −20dB	NEW XL-II90	REC/PB	AC voltmeter	R-463(Ch.L) R-464(Ch.R)	Same level at REC/PB	Input VR maximum
7	Record level	Fig-1	1kHz		REC PAUSE	AC voltmeter	Attenutor of AF OSC output	350mV	Input VR maximum
					REC/PB	AC voltmeter	R-401(Ch.L) R-402(Ch.R)	Same level at REC/PB	
8	Clock	Frequency counter to TP-5 10 : 1 cabie				Frequency counter	R-722	160 to 170kHz	

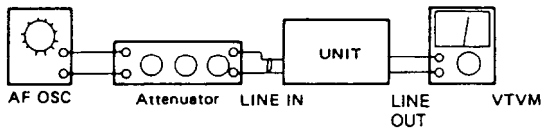
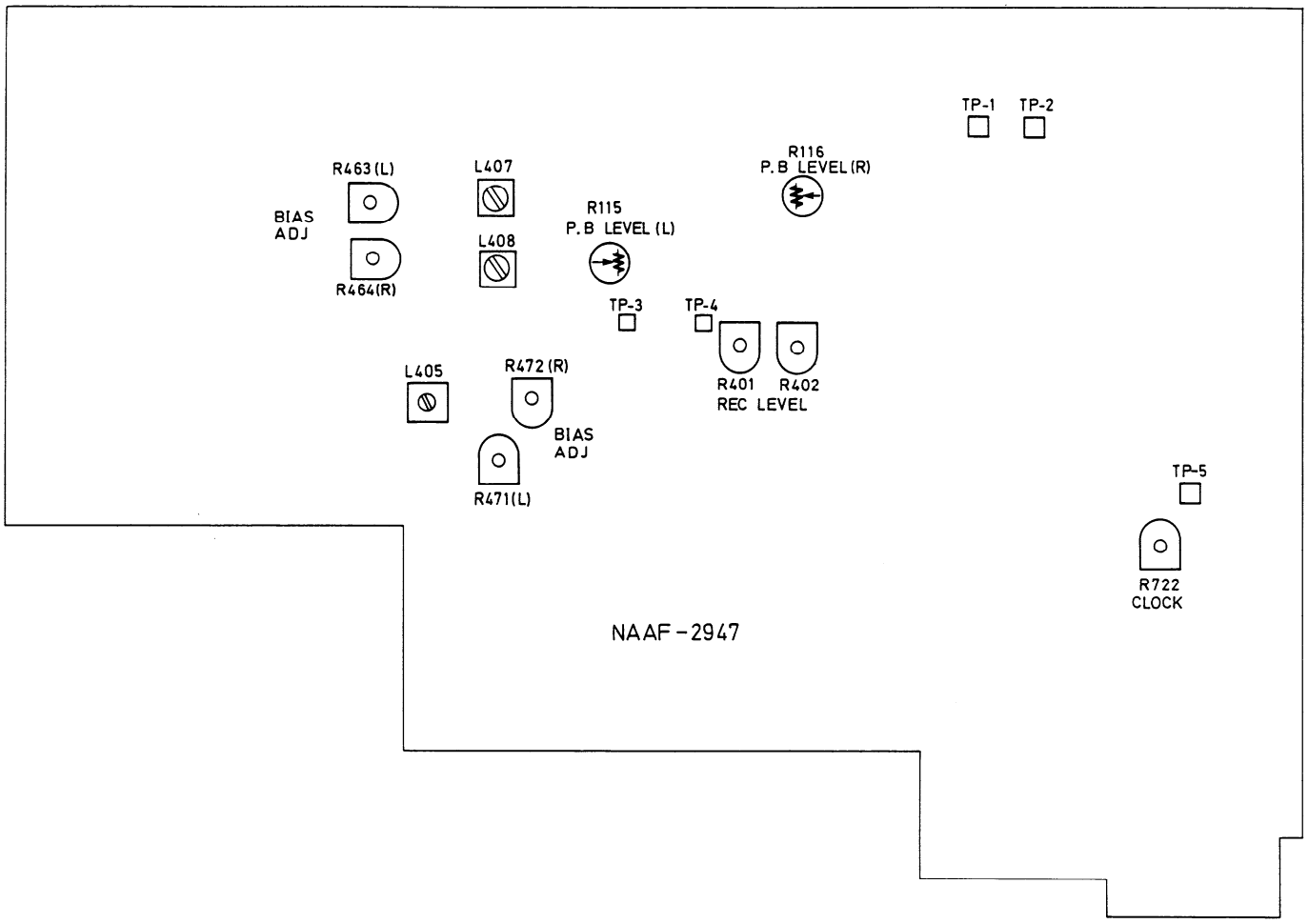
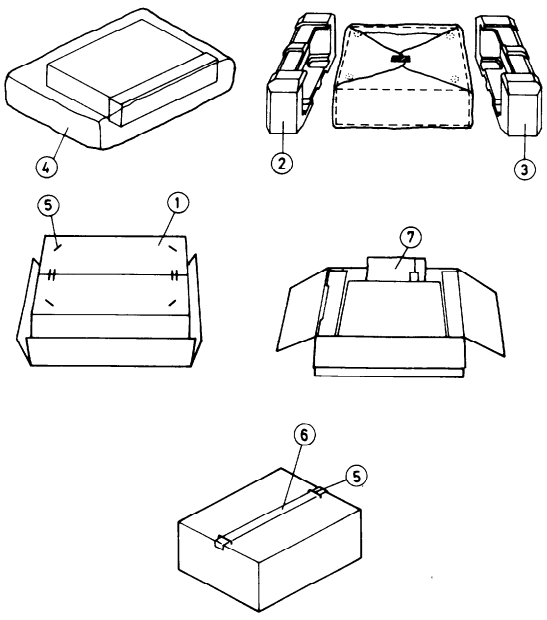


fig-1



PACKING VIEW



D Model

REF NO.	PART NO.	DESCRIPTION
1	29051487	Master carton box
2	29090987	Pad(L)
3	29090988	Pad(R)
4	29100037A	650X500 Poly bag
5	282301	Sealing hook
6	260012	Damplon tape
7	Accessary bag ass'y	
	29341131	Instruction manual
	2010095	Connection cable
	29365019	Waranty card(N)
	29358002E	Service station list(N)
	29100006A	350X250 Poly bag

G/W Model

REF NO.	PART NO.	DESCRIPTION
1	29051487	Master carton box
2	29090987	Pad(L)
3	29090988	Pad(R)
4	29100037A	650X500 Poly bag
5	282301	Sealing hook
6	260012	Damplon tape
7	Accessary bag ass'y	
	29341132	Instruction manual
	29341164	Instruction manual I(G)
	2010095	Connection cable
	25055018	Conversion plug (CV-K-2)(W)
	29100006A	350X250 Poly bag

NOTE
(N) : Only U.S.A. Model
(W) : Only 120/220V Model
(G) : Only 220V Model

CHASSIS EXPLODED VIEW PART LIST

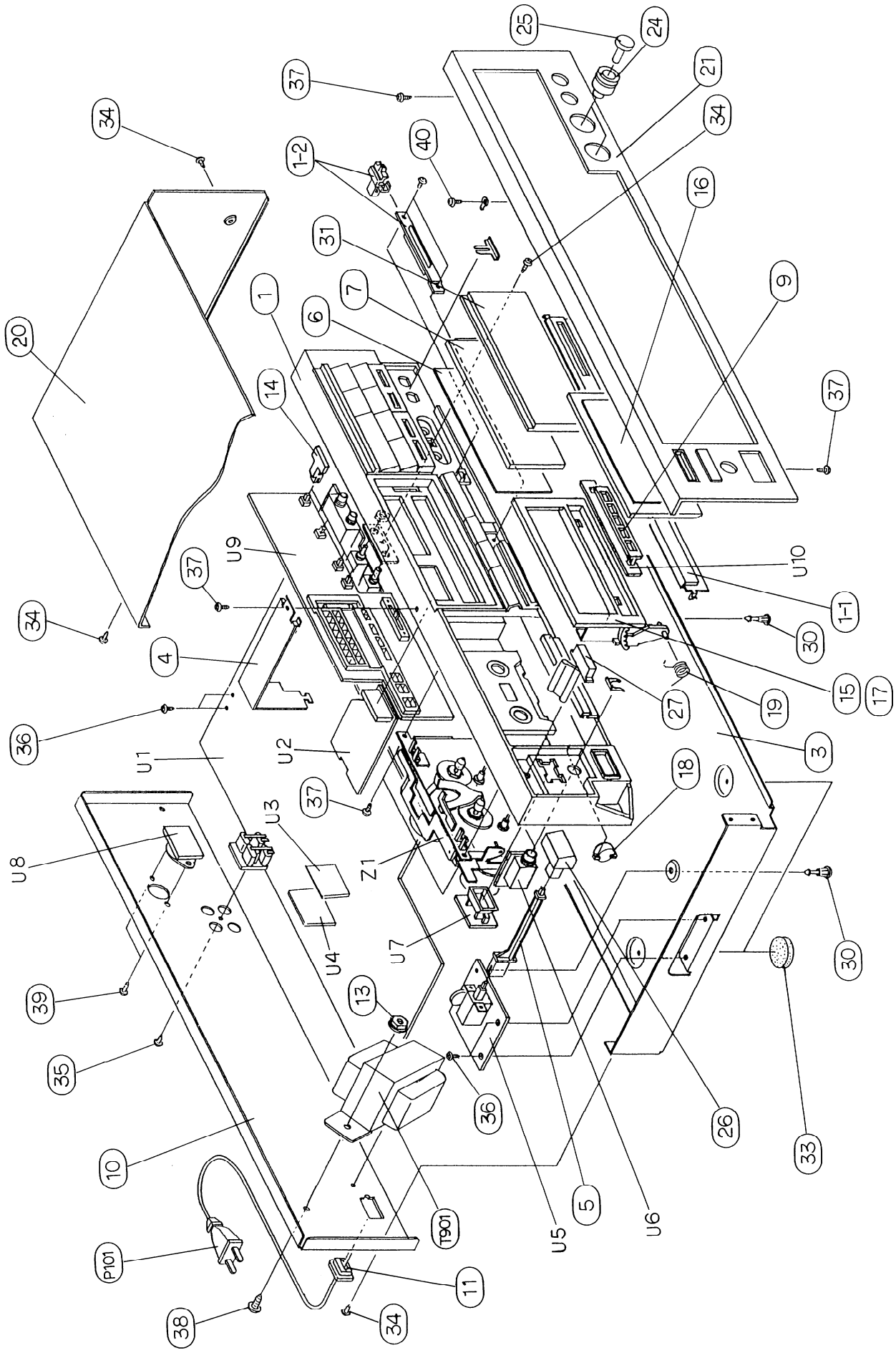
REF.NO.	PART NO.	DESCRIPTION
1	27110347	FRONT BRACKET AS
1-1	28194266	DECORATION PLATE (M)
1-2	28322938	KNOB(SLIDE)AS
3	27100122	BOTTOM BOARD
4	27141119	BRACKET (PC)
5	27273069A	JOINT (POW)
6	28133178A	BACK PLATE
7	28130244A	INDICATOR PLATE
8	27190520	HOLDER
9	27190521	HOLDER (L.E.D.-5)
10	27120965	BACK PANEL (D)
	27120966	BACK PANEL (G)
	27120967	BACK PANEL (W)
	27121017	BACK PANEL (Q)
11	⚠ 27300750	STRAINRELIEF
13	86414010	FLANGE NUT FWN4X10FN
14	28322940A	KNOB (SKIP)
15	28400312	CASSETTE LID
16	28400313A	WINDOW
17	27180272	SPRING (CA)
18	28400282	DAMPER
19	27180334	SPRING
20	28184346-1	TOP COVER
21	1N006121	FRONT PANEL
24	28322946	KNOB (BAL)
25	28322948	KNOB (VOL)
26	28322795	KNOB (POW)
27	28322970	KNOB AS (EJ)
30	27190524	HOLDER
31	28191396	CLEAR PLATE
33	27175028	LEG
34	834430088	TAP-TIGHT SCREW 3TTS+8BBC
35	834430108	TAP-TIGHT SCREW 3TTS+10BB
36	831130088	TAP-TIGHT SCREW 3TTW+8B
37	833430080	TAP-TIGHT SCREW 3TTP+8PBC
38	830440109	TAP-TIGHT SCREW 4TTC+10CB
39	82142604	PAN-HEAD SCREW 2.6P+4F BC
40	834230108	TAP-TIGHT SCREW 3TTS+10BN
T901	⚠ 2300203	NPT-956D, POWER TRANSFORMER (D)
	⚠ 2300205	NPT-956G, POWER TRANSFORMER (G)
	⚠ 2300204	NPT-956DG, POWER TRANSFORMER (W)
	⚠ 2300241	NPT-956Q, POWER TRANSFORMER (Q)

REF.NO.	PART NO.	DESCRIPTION
P101	⚠ 253099C	AS-UC-3, POWER SUPPLY CORD (D)
	⚠ 253129A	AS-CEE, POWER SUPPLY CORD (G/W)
	⚠ 253118	AS-SAA, POWER SUPPLY CORD (Q)
S901	⚠ 25065123	NSS-1258P, VOLTAGE SELECTOR (W)
Z1	244104	NDM-96, TAPE MECHANISM ASS'Y
U1	1N007547-1	NAAF-2947-1, MAIN PC BOARD ASS'Y (D)
	1N007547-1A	NAAF-2947-1A, MAIN PC BOARD ASS'Y (G/W/Q)
U2	1N007548-1	NADIS-2948-1, DISPLAY PC BOARD ASS'Y
U3	1N007549-1	NADIS-2949-1, PLAY BACK AMPLIFIER PC BOARD ASS'Y
U4	1N007550-1	NAETC-2950-1, SEARCH AMP PC BOARD ASS'Y
U5	⚠ 1N007551-1	NAPS-2951-1, POWER SWITCH PC BOARD ASS'Y
U6	1N007552-1	NAAR-2952-1, HEAD PHONE TERMINAL PC BOARD ASS'Y
U7	1N007553-1	NADIS-2953-1, HX PRO INDICATOR PC BOARD ASS'Y
U8	1N007554-1	NAAR-2954-1, REMOTE CONTROL PC BOARD ASS'Y
U9	1N007543-2	NADIS-2943-2
U10	1N007544-2	NADIS-2944-2

NOTE (D): Only 120V model
(G): Only 220V model
(W): Only 120V/220V model
(Q): Only 240V model
(B): Black model

NOTE: THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.

CHASSIS-EXPLODED VIEW



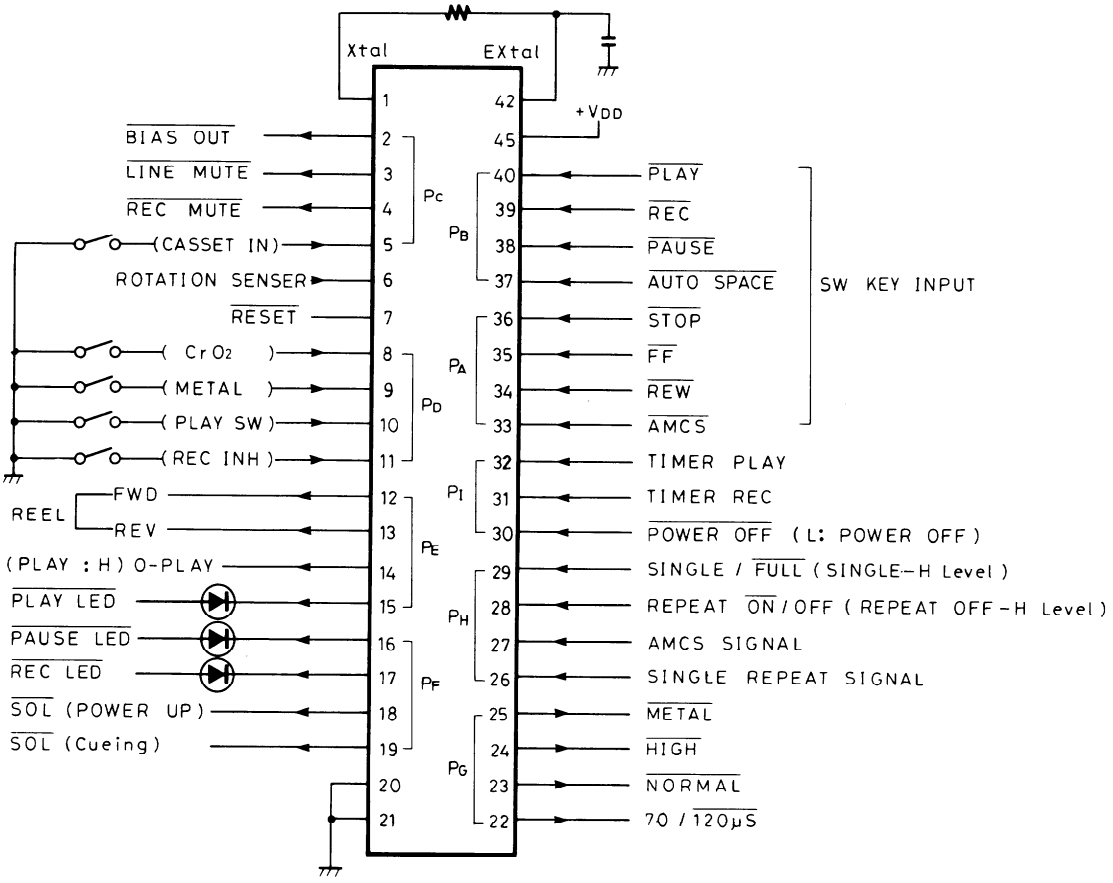
MICROCOMPUTER (LM6405L-1994)

In the microcomputer, the operating voltage is high with the NMOS type LM6405L using V_{DD} = 6V. The clock uses a condenser/resistor oscillator and is designed for a frequency of 170KHz. (Frequency measurement can be made by connection through a 100KΩ ~ 330KΩ to pin No. 1.)

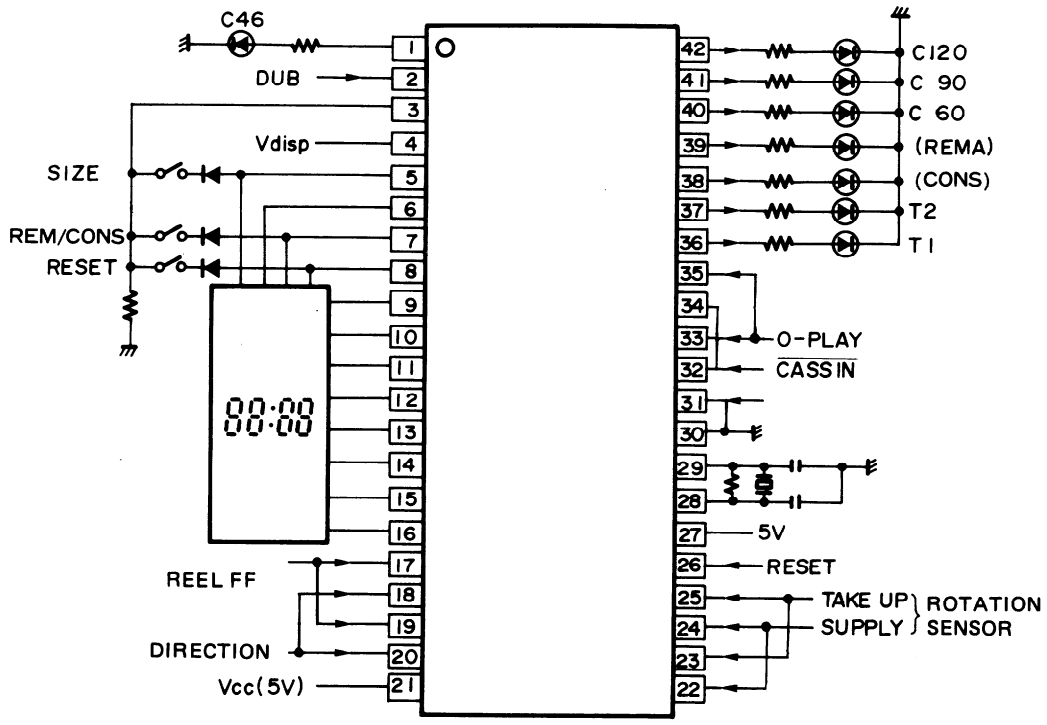
Port No.	Name	Function
1	XTAL	Connected to resistor of oscillator for clock use
2	$\overline{\text{BIAS OUT}}$	Output port for turning bias oscillator ON/OFF: Oscillation with 0 level
3	$\overline{\text{LINE MUTE}}$	Output port for line muting: Muting with 0 level
4	$\overline{\text{REC. MUTE}}$	Output port for recording muting: Muting with 0 level
5	$\overline{\text{CASSETTE IN}}$	Input for cassette loading detection: Cassette loading with 0 level
6	ROTATION SENSOR	Pulse input rotation detection
7	$\overline{\text{RESET}}$	System reset for microcomputer use
8	CrO_2	Input for automatic detection of chrome tape: Chrome use hole detection with 1 level
9	METAL	Input for automatic detection of metal tape: Metal use hole detection with 1 level
10	$\overline{\text{PLAY SWITCH}}$	Input for PLAY position detection: PLAY position with 0 level
11	REC. INH	Lug detection input for recording prevention: Disable with 1 level
12	REEL FF	Output for reel motor rotation in fast forward direction: Rotation with 1 level
13	REEL REW	Output for reel motor rotation in rewind direction: Rotation with 1 level
14	O PLAY	Reel motor rotation selection: Slow with 1 Fast with 0
15	$\overline{\text{PLAY LED}}$	LED output for PLAY indication: Lights with 0
16	$\overline{\text{PAUSE LED}}$	LED output for PAUSE indication: Lights with 0
17	$\overline{\text{REC LED}}$	LED output for REC indication: Lights with 0
18	$\overline{\text{SOL. P-UP}}$	Output for solenoid pull in: Pull in with 0
19	$\overline{\text{SOL}}$	Output for solenoid pull in hold (low power): Pull in hold with 0
20	TEST	Input for microcomputer chip inspection (Normally connected to V_{SS})
21	V_{SS}	Ground terminal
22	70 μs/$\overline{120\ \mu s}$	For input to pins 8, 9, output for play back equalizer selection
23	$\overline{\text{NORMAL}}$	For input to pins 8, 9, output for record equalizer selection (NORMAL)
24	HIGH	For input to pins 8, 9, output for record equalizer selection (HIGH)
25	METAL	For input to pins 8, 9, output for record equalizer selection (METAL)
26	SINGLE SIG.	Input for recording signal detection for single repeat when in low speed
27	AMCS SIG.	Input for recording signal detection for AMCS use when in high speed
28	REPEAT OFF/$\overline{\text{ON}}$	Input for repeat operation ON/OFF: Operates with 0
29	SINGLE/$\overline{\text{FULL}}$	Selection of SINGLE/FULL operation: Full repeat with 0

Port No.	Name	Function
30	$\overline{\text{P OFF}}$	Input for power off detection: Off with 0
31	$\overline{\text{TIMER REC}}$	Input for timer recording ON/OFF: Operates with 0
32	$\overline{\text{TIMER PLAY}}$	Input for timer play back ON/OFF: Operates with 0
33	$\overline{\text{AMCS}}$	Key input to cause AMCS operation: Operation with 0
34	$\overline{\text{REW}}$	Key input to cause rewinding: Operation with 0
35	$\overline{\text{FF}}$	Key input to cause fast forward operation: Operation with 0
36	$\overline{\text{STOP}}$	Key input to cause stop operation: Operation with 0
37	$\overline{\text{AUTO SPACE}}$	Key input to cause auto space operation: Operation with 0
38	$\overline{\text{PAUSE}}$	Key input to cause pause or recording pause: Operation with 0
39	$\overline{\text{REC}}$	Key input pushed together with PLAY key to cause recording: Operation with 0
40	$\overline{\text{PLAY}}$	Key input for play back or recording: Operation with 0
41	V_{DD}	Power source terminal
42	E.XTAL	Connects to resistor and condenser of oscillator for clock

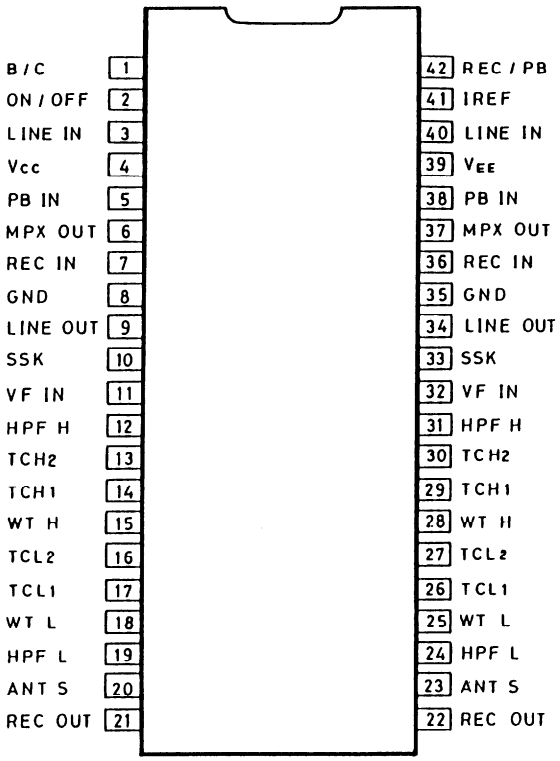
NOTE 0: Low level
1: High level

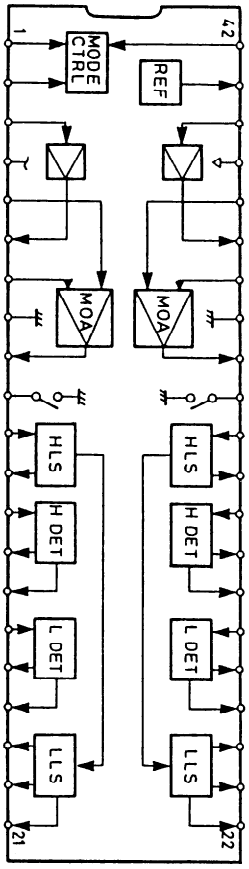


HD614120S-A27 (Counter)

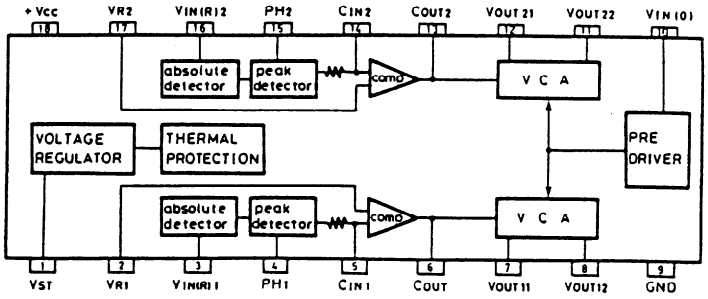


CX20187 (DOLBY N.R)



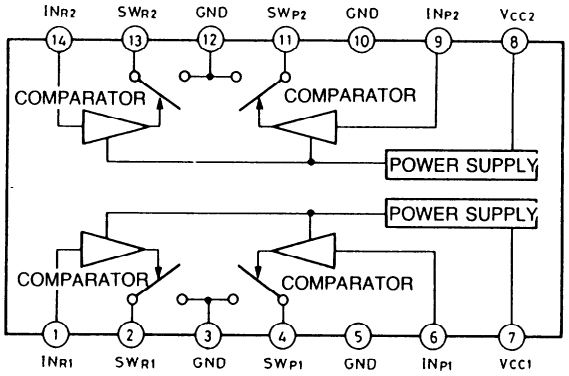


μPC1297CA (DOLBY HX PRO SYSTEM)

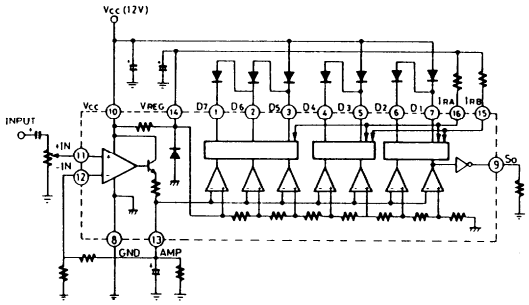


When the HX PRO is operation, by means of the recording signal coming from the recording head, a modulating oscillator voltage is applied to the absolute value detection circuit, and by means of the recording signal level peak detection value, the bias current is instantaneously controlled At such time, by means of the CR integrated circuit, the frequency characteristic is maintained.

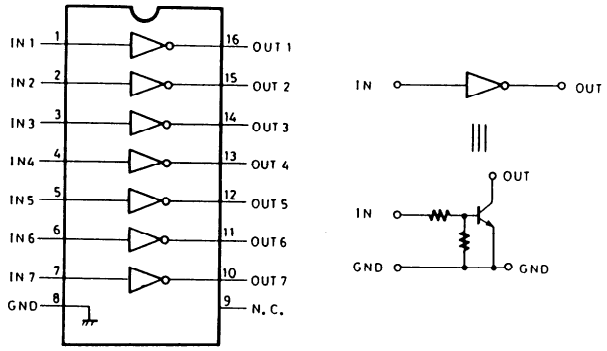
μPC1290C



IR2E02 (LEVEL METER DRIDE)



BA6251 (REC AMP. EQ. SW)



TAPE MECHANISM-PART LIST

REF NO.	PART NO.	DESCRIPTION
1	24611206	CHASSIS (A)
2	24606244	SOLENOID COIL
3	24611207	HOUSING AS (R)
4	24607048	SHIFT ARM AS
5	24604077	COLLAR (SHIFT ARM)
6	24605604	SPRING (SHIFT ARM)
7	24602370	GEAR AS (IDLER) (⑦+⑧+⑨+⑪+⑩③)
8	24611208	WASHER (IDLER)
9	24602362	GEAR (IDLER)
10	24611312	BE-SU (IDLER)
11	24605605	SPRING (CLUTCH)
12	24602363	GEAR (MOTOR)
14	24611210	GUIDE (CASSETTE)
15	24611211	GUIDE (CASSETTE) L
16	24611212	GUIDE (CASSETTE) R
17	24605606	SPRING (PACK)
18	24611213	WASHER (REEL)
19	24605607	SPRING (REEL)
20	24602364	REEL
21	24605617	SPRING (HEAD CHASSIS) F
22	24611214	HEAD CHASSIS (A)
23	24611215	HEAD BASE
24	24605608	SPRING (HEAD)
25	24605609	SPRING (REEL) C
26	24602365	GEAR (PLAY)
27	24607064	PL ARM
28	24605610	SPRING (PL ARM)
29	24602366	FLYWHEEL AS
30	24604078	SPACER (CAPSTAN)
31	24611216	HOLDER (MOTOR) A
32	24602367	BELT (A)
33	24602368	MOTOR PULLEY (A)
34	24602369	PINCH ROLLER AS (R)
35	24605611	SPRING (PINCH ROLLER) R
36	24611217	PROTECTOR (SW)
38	24611218	HOLDER (EJECT)
39	24611219	STOPPER (CASSETTE)
40	24611220	EJECTOR
41	24605612	SPRING (EJECT) A
42	24605613	SPRING (EJECT) B
43	24607050	ARM (EJECT LOCK)
44	24604079	COLLAR (LOCK ARM)
45	24605614	SPRING (LOCK ARM)
47	24611313	REFLECTOR
48	24606275	P.C.BOARD
49	24606276	PHOTO REFLECTOR RPS401
52		3P WIRE
53		3P WIRE
54		11P WIRE
55		6P WIRE
56		2P WIRE
60	24611227	CORD CLAMPER
61	24611228	CORD CLAMPER
62	24600051	R/P HEAD
63	24600041	E HEAD
64	24601200	CAPSTAN MOTOR AS (㉝+㊹)
65	24601201	REEL MOTOR AS (⑫+㊸+㊿)
66	24606245	LEAF SWITCH
67	24606246	LEAF SWITCH
69	801367	SCREW (A)
70	801368	SCREW (B)
73	8771224303	WASHER (L)
74	24611229	PLASTIC WASHER 1.6X3.5X.5
75	24611296	PLASTIC WASHER 2.1X4.0X.5
76	24611230	NYLON WASHER 1.9X5X.5
78	833120047	TAP-TIGHT SCREW M2X4
79	838120047	TAP-TIGHT SCREW M2X4
80	833120057	TAP-TIGHT SCREW M2X5
81	833120087	TAP-TIGHT SCREW M2X8
84	801369	FLAT SCREW M2.6X4
85	82112604	PAN-HEAD SCREW 2.6P+4F
86	82152011	SCREW M2X11
87	801370	SCREW/W.WASHER M2X10
88	801371	SEMS SCREW M2.6X4
90	24611231	SHIELD PLATE
93	24603333	BRAKE LEVER (N)
94	24607051	BRAKE ARM
95	24605616	SPRING (BRAKE)
97	24604080	COLLAR (SHIFT ARM)
103	24611233	PLASTIC WASHER 1.7X3.5X.5
104	24611234	PLASTIC WASHER 2.1X6.8X.4

PRINTED CIRCUIT BOARD-PARTS LIST

N AAF-2947-1

CIRCUIT NO.	PART NO.	DESCRIPTION
	Ics	
Q101	22240008	μPC-1290C
Q107	222502	NJM4558DX
Q109, Q111	222465 or	NJM4558D or
	222921	BA4558D
Q201	222999	CX-20187
Q301	222652	M5218L
Q303, Q304	222623	IR2E02
Q403	222918	BA6251
Q405, Q415	222465 or	NJM4558D or
	222921	BA4558D
Q417	222959	μPC-1297CA
Q701	222955	LM6405L-1994
Q708	222775	BA6229
	Transistors	
Q113, Q114	2212303 or	2SK381C or (G/W/Q)
	2211944	2SK246Y
Q203, Q204,	2212794 or	2SD1468R or
Q401, Q402	2212795	2SD1468S
Q407	2211455 or	2SA1015GR or
	2212495	JA101Q
Q408	2201593 or	2SD1189P or
	2201594	2SD1189Q
Q409	2211255 or	2SC1815GR or
	2210746	2SC945AP
Q410, Q411	2211544	2SC1959Y
Q412-Q414	221281	DTC114YS
Q419	2211455 or	2SA1015GR or
	2212495	JA101Q
Q601	2211255 or	2SC1815GR or
	2210746	2SC945AP
Q602	2212600	DTA124ES
Q603	221281	DTC114YS (G/W/Q)
Q703, Q704	2211455 or	2SA1015GR or
	2212495	JA101Q
Q705, Q706	2212855,	2SB1068U,
	2212853,	2SB1068K,
	2212852,	2SB1068L,
	2212846 or	2SB598F or
	2212845	2SB598E
Q707	221282	DTC144ES
Q709, Q710	2211255 or	2SC1815GR or
	2210746	2SC945AP
Q711-Q713	2213090	DTA114YS
Q714	2211255 or	2SC1815GR or
	2210746	2SC945AP
Q901	2201385	2SD330E
Q902, Q904	2211255 or	2SC1815GR or
	2210746	2SC945AP
Q905	2201275 or	2SB772Q or
	2201276	2SB772P
Q906	2211455 or	2SA1015GR or
	2212495	JA101Q
Q907	2212303 or	2SK381C or
	2211944	2SK246Y
Q908, Q909	2211455 or	2SA1015GR or
	2212495	JA101Q
	Diodes	
D101-D104	223163 or	1SS133 or
	223155	1SS138
D105-D106	223150,	US1040, (G/W/Q)
	223124 or	1S2473 or
	223145	1S2076TD
D107	223150,	US1040,
	223124 or	1S2473 or
	223145	1S2076TD
D401, D402,	223163 or	1SS133 or
D404-D406	223155	1SS138
D601	2239553 or	RD8.2EB3 or (G)
	2243193	MTZ8.2C
D701, D702,	223150,	US1040,
D704	223124 or	1S2473 or
	223145	1S2076TD
D703	223163 or	1SS133 or
	223155	1SS138
D901-D904	223891	RL152
D905, D906	223163 or	1SS133 or
	223155	1SS138
D907	2239472 or	RD5.6EB2 or
	2243152	MTZ5.6B
D908, D909	223163 or	1SS133 or
	223155	1SS138
	Coils	
L201, L202	233313	NMC6048
L203, L204	233353	NMC2058
L401, L402	24606072,	NCH1010,
	231085 or	NCH2133 or
	231040	NCH2080
L403, L404	233314	NCH2097
L405	231063	NLO2037
L406	231077 or	NCH2125 or
	231025	NCH1064
L407, L408	231127	NCH4183
	Capacitors	
C103, C104	354721019	100μF, 6.3V, Elect.
C111, C112	354780479	4.7μF, 50V, Elect.
C123, C124	354741009	10μF, 16V, Elect.
C127, C128	354780109	1μF, 50V, Elect.
C201, C202	352980226	2.2μF, 50V, NP
C203, C204	352950476	4.7μF, 25V, NP
C225-C228	354780479	4.7μF, 50V, Elect.
C229	352980226	2.2μF, 50V, NP
C231, C232	352980226	2.2μF, 50V, NP
C321, C322	354780479	4.7μF, 50V, Elect.
C323, C324	354780109	1μF, 50V, Elect.
C401, C402	354742209	22μF, 16V, Elect.
C411, C412	354784799	0.47μF, 50V, Elect.
C413, C414	354780479	4.7μF, 50V, Elect.
C451	354741009	10μF, 16V, Elect.
C452	354744709	47μF, 16V, Elect.
C455	370131234	0.12μF, 100V, APS.
C469, C470	370131514	150PF, 100V, APS.
C471-C473	354741009	10μF, 16V, Elect.
C477	354721019	100μF, 6.3V, Elect.
C479	354784799	0.47μF, 50V, Elect.
C480	354742209	22μF, 16V, Elect.
C601, C603	354780109	1μF, 50V, Elect.
C604, C605	354741009	10μF, 16V, Elect.
C700	354744709	47μF, 16V, Elect.
C701	354780109	1μF, 50V, Elect.
C702	354781099	0.1μF, 50V, Elect.
C706	352942206	22μF, 16V, NP
C709	354724719	470μF, 6.3V, Elect.
C903	354746829	6800μF, 16V, Elect.
C904	354744729	4700μF, 16V, Elect.

CIRCUIT NO.	PART NO.	DESCRIPTION
C907	354781099	0.1μF, 50V, Elect.
C908	354741009	10μF, 16V, Elect.
C909, C910	354721019	100μF, 6.3V, Elect.
C911	354724719	470μF, 6.3V, Elect.
C912	354780479	4.7μF, 50V, Elect.
C913, C914	354742209	22μF, 16V, Elect.
C915	354780109	1μF, 50V, Elect.
C916-C918	354744709	47μF, 16V, Elect.
	Resistors	
R115, R116	5210064	N06HR10kB, Semi-fixed
R133, R134	5104203	N09RGL50kA, Variable
R139, R140	5104203	N09RGL50kA, Variable
R401, R402	5215045	N08HR10kBC, Semi-fixed
R431	441521014	100Ω, 1/2W, Oxidefilm
R463, R464	5215045	N08HR10kBC, Semi-fixed
R701-R713	49163392413	3.9kΩX13, 1/10W, Network
R714-R721	49163392408	3.9kΩX8, 1/10W, Network
R722	5215003	N08HR20kBC, Semi-fixed
⚠ R730	441723904	39Ω, 1/2W, Oxidefilm
⚠ R731	441622204	22Ω, 1W, Oxidefilm
⚠ R901, R902	442520104	1Ω, 1/2W, Oxidefilm
⚠ R906	442522704	27Ω, 1/2W, Oxidefilm
	Plugs	
P101	25055136	NPLG-6P120
P401	25055132	NPLG-2P116
P704	25055185	NPLG-4P169
P710	25055141	NPLG-11P125
P711	25055133	NPLG-3P117
	Terminal	
P103	25045217	NPJ-4PDBL95, Input/output
P105	25045134	HLJ4337-01-010, Mic.
P107	25050064	NSCT-5P18, DIN (G/W/Q)
	Socket	
	25050272	NSCT-8P100, Meter
	25050270	NSCT-6P98, Accu VR.
	25050273	NSCT-9P101
	25050270	NSCT-6P98, DOL B/C
	Miscellaneous	
	27160151	RAD54, Radiator(Q905)
	27160150	RAD53, Radiator(Q901)
	82143006	3P+6FN, Screw
	27141121	Bracket(SW)

N ADIS-2948-1

CIRCUIT NO.	PART NO.	DESCRIPTION
	Ics	
Q702	22240041	HD614120S-A27
Q715	222840692	4069UBP
	Transistoers	
Q716	221282	DTC-144ES
Q717	2212600	DTA-124ES
Q718	2211255 or	2SC1815GR or
	2210746	2SC945AP
	Diodes	
D710-D712	223163 or	1SS133 or
	223155	1SS138
	Capacitors	
C714	354741009	10μF, 16V, Elect.
C715	354744709	47μF, 16V, Elect.
	Miscellaneous	
Q719	212036	4-ST-01-ZS1, Display tube
X701	3010099	CSA4.00MG, Ceramic OSC
P702	25055184	NPLG-4P169, Plug
P703	25055187	NPLG-6P171, Plug
P712	25055133	NPLG-3P117, Plug
	25050272	NSCT-8P100, Socket

N AAF-2949-1

CIRCUIT NO.	PART NO.	DESCRIPTION
	Ic	
Q103	22240020	NJM2068S-D
	Transistors	
Q105, Q106	2211255 or	2SC1815GR or
	2210746	2SC945AP
	Plug	
P109	25055324	NPLG-10P307

NOTE (G): Only 220V model
(W): Only 120V/220V model
(Q): Only 240V model

NOTE: THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.

PRINTED CIRCUIT BOARD PARTS LIST

NAETC-2950-1

CIRCUIT NO.	PART NO.	DESCRIPTION
	Ics	
Q501	222736	NJM4558S
Q503	222695, 222681 or 22240040	LA6324, IR3702 or NJM2902N
	Diodes	
D501-D506	223163 or 223155	1SS133 or 1SS138
	Capacitors	
C504	354781099	0.1μF, 50V, Elect.
C505	354780109	1μF, 50V, Elect.
C506	354741009	10μF, 16V, Elect.
	Plug	
P501	25055324	NPLG-10P307

N APS-2951-1

CIRCUIT NO.	PART NO.	DESCRIPTION
⚠ C901	3500065A	0.01μF, 400V, AC, Capacitor IS
⚠ S901	25035559	NPS-111-L521P, Power

N AAR-2952-1

CIRCUIT NO.	PART NO.	DESCRIPTION
P301	25045139	HLJ0540-01-010, Headphone

N ADIS-2953-1

CIRCUIT NO.	PART NO.	DESCRIPTION
D901	225228-J or 225228-K	SLV-31MC(J) or SLV-31MC(K)
	27190522	Holder(LED-1)

NAAR-2954-1

CIRCUIT NO.	PART NO.	DESCRIPTION
P701	25050070	NSCT-7P20, Socket

NADIS-2943-2

CIRCUIT NO.	PART NO.	DESCRIPTION
	LEDs	
D301-D308	225228-J or 225228-K	SLV-31MC(J) or SLV-31MC(K)
D310-D314	225227	SLV-31VC
D661, D662	225227	SLV-31VC
D663-D665, D751-D756	225228-J or 225228-K	SLV-31MC(J) or SLV-31MC(K)
	Lamp	
⚠ PL901	210090	150mA, 14V, Lamp
	Resistor	
R481	6111002	5kB5Z, Variable
	Switchs	
S601, S602	25035523	NPS-122L485, Push
S712-S723	25035548	NPS-111S510, Push
S724, S725	25035523	NPS-122L485, Push

CIRCUIT NO.	PART NO.	DESCRIPTION
	Socket	
P702A	2000665	NSAS-8P621
P703A	2000603	NSAS-12P559
	Holder	
	27190523A	Holder(LED-25)

NADIS-2944-2

CIRCUIT NO.	PART NO.	DESCRIPTION
	LED	
D666, D668	225190	GL1PR1
D667	225192	GL1NG1
	Socket	
P704A	2000516	NSAS-8P472

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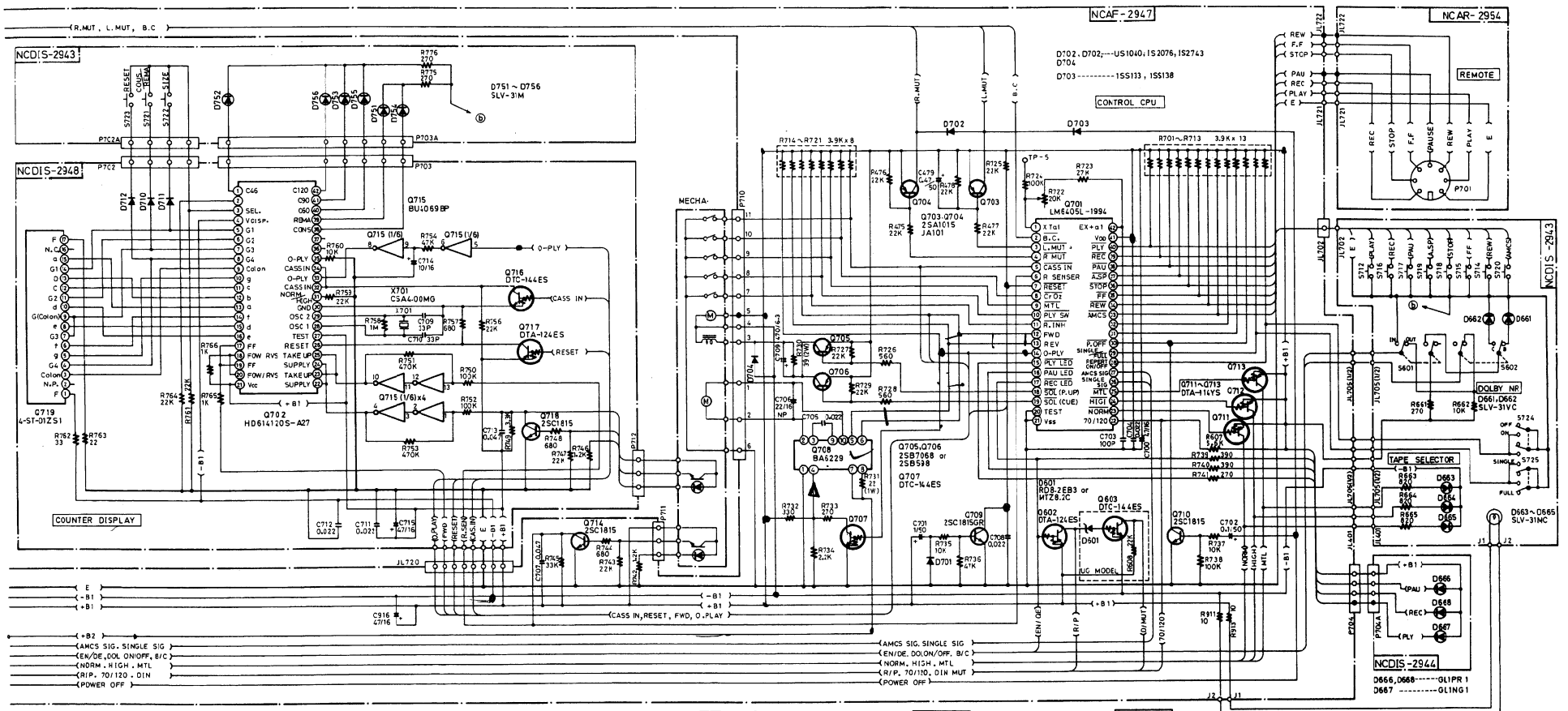
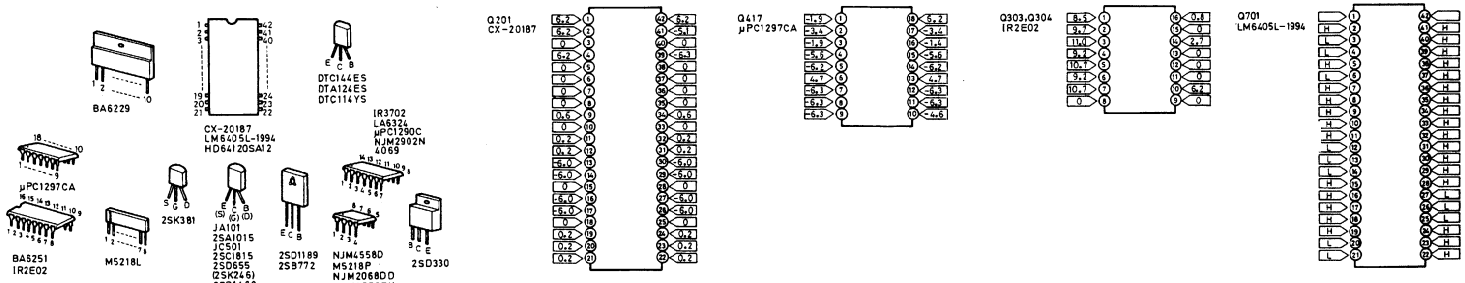
SCHEMATIC DIAGRAM (CONTROL SECTION)





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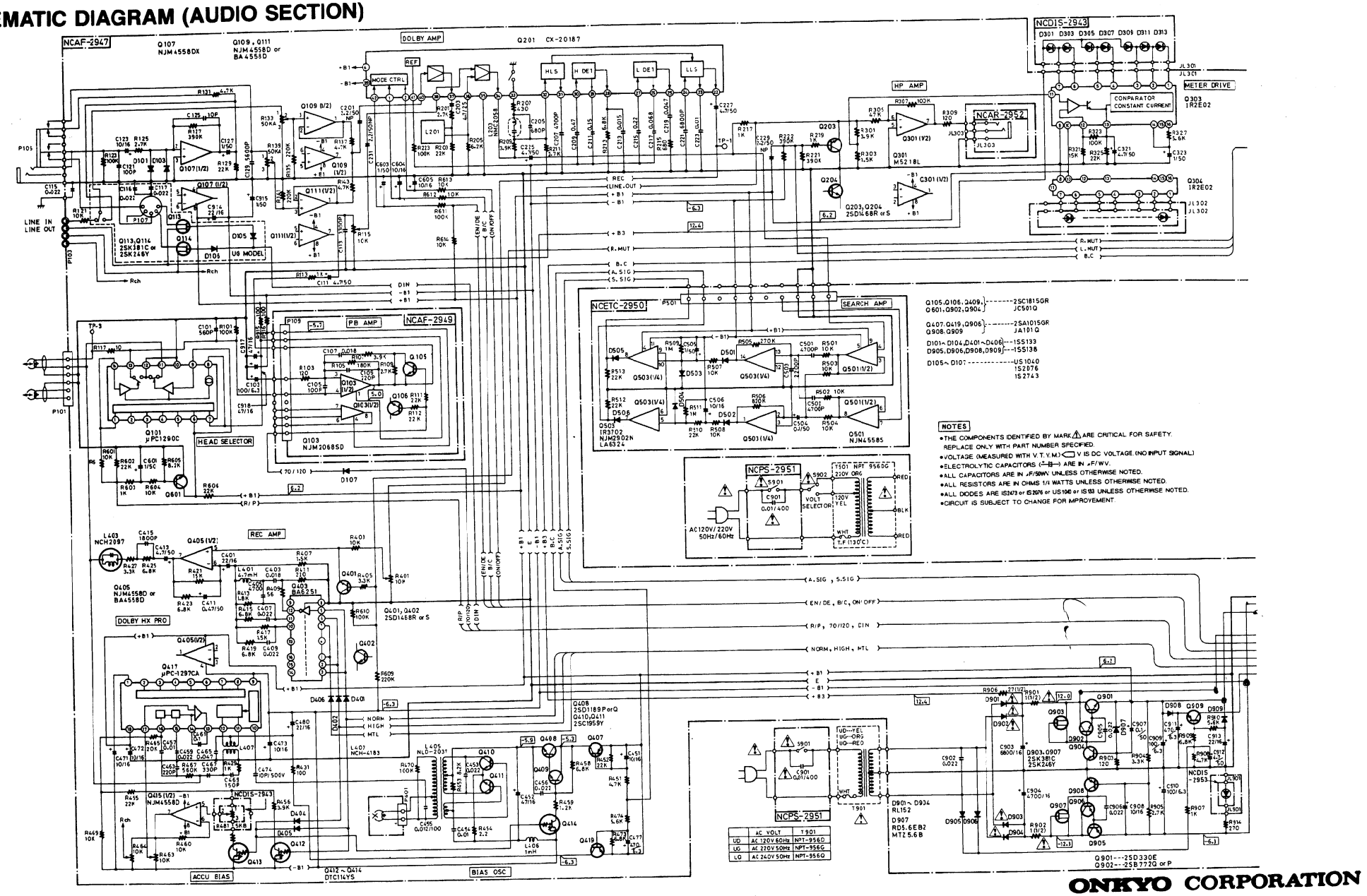
SCHEMATIC DIAGRAM (AUDIO SECTION)



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TAPE MECHANISM-EXPLODED VIEW