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ONKYO SERVICE MANUAL**STEREO CASSETTE
TAPE DECK
MODEL TA-R200**

| | |
|------------|----------------------|
| UD, UD (N) | 120V AC, 60Hz |
| UW | 120/220V AC, 50/60Hz |
| UQ | 240V AC, 50Hz |

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK Δ 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.

SPECIFICATIONS

Track Format: 4-tracks, 2-channels
Erasing System: AC erase
Tape Speed: 4.8 cm/sec. (1-7/8 i.p.s.)

Wow and Flutter: 0.07% (WRMS)
Frequency Response: 20-15,000Hz (Normal)
(30-14,000Hz \pm 3dB)
20-16,000Hz (High)
(30-15,000Hz \pm 3dB)
20-17,000Hz (Metal)
(30-16,000Hz \pm 3dB)
S/N Ratio: 58dB (metal tape, Dolby NR off)
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: 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
Headphone jack: 1
optimum load impedance: 8 to 200 ohms
Motors: DC servo motor: 1
Heads: REC/PB: Special Hard Permalloy \times 1;
Erase head: Ferrite \times 1
Power Supply Rating: U.K. and Australian models:
AC 240V, 50Hz
U.S.A. and Canadian models:
AC 120V, 60Hz.
Worldwide models:
AC 120V and 220V switchable, 50/60Hz
Power Consumption: 11 watts
Dimensions: 435(W) \times 122(H) \times 264(D)mm
(17-1/8" \times 4-13/16" \times 10-3/8")
Weight: 3.9 kg. (8.6 lbs.)

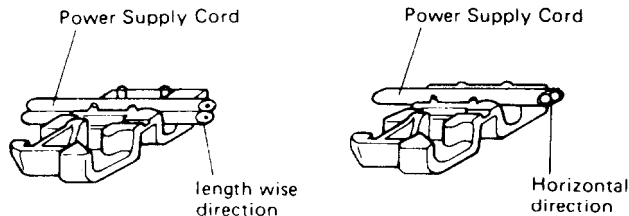
Specifications and external appearance are subject to change without notice because of product improvements.



SERVICE PROCEDURES

1. 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.



2. Insulating resistance measurement

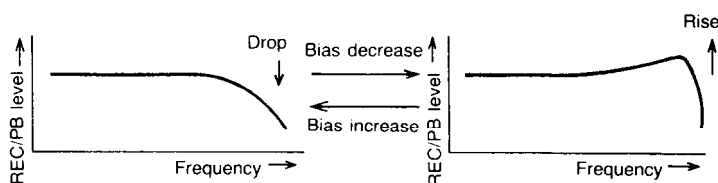
Connect the insulating-resistance tester between the plug of power supply cord and chassis.

Specifications: 500V more than 10MΩ

HX PRO CIRCUIT OPERATION EXPLANATION

1. Regarding recording frequency characteristic and bias

Ordinarily, if the recording bias current is increased, REC/PB frequency response level in the high frequency region (about 10KHz and above) drops, and if the bias is decreased, the response rises.



2. Regarding the basic operation of HX PRO (Refer to Fig. 1)

The HX PRO uses the μ PC1297CA IC. The operation is in accordance with the following.

- 1) At (a), the recording bias is added onto the audio signal, and the recording signal is detected. This is the same as the recording head recording the signal on the tape.
- 2) The signal of 1) preserves the frequency response with the integrated circuit of (b).

$$\text{Frequency} = \frac{R435 + R433}{2\pi \times C435 \times R435 \times R433} \quad (2.1)$$

By means of the frequency of Fig. 1, the frequency which is effective from the beginning is determined. In the ordinary situation, this is half the audio band (10KHz), (10KHz ~ 7.5KHz).

- 3) At (c), in order to use the affected waveform after-ward, absolute detection is carried out.

- 4) At (d), the waveform peak value is detected. The output becomes the peak DC voltage.

- 5) At (e), the standard voltage and the voltage of (4) are compared.

- 6) With the output of (e), the frequency generation level is controlled (voltage controlled amplifier). That is, the bias size is varied.

- 7) Summing up 1) ~ 6):

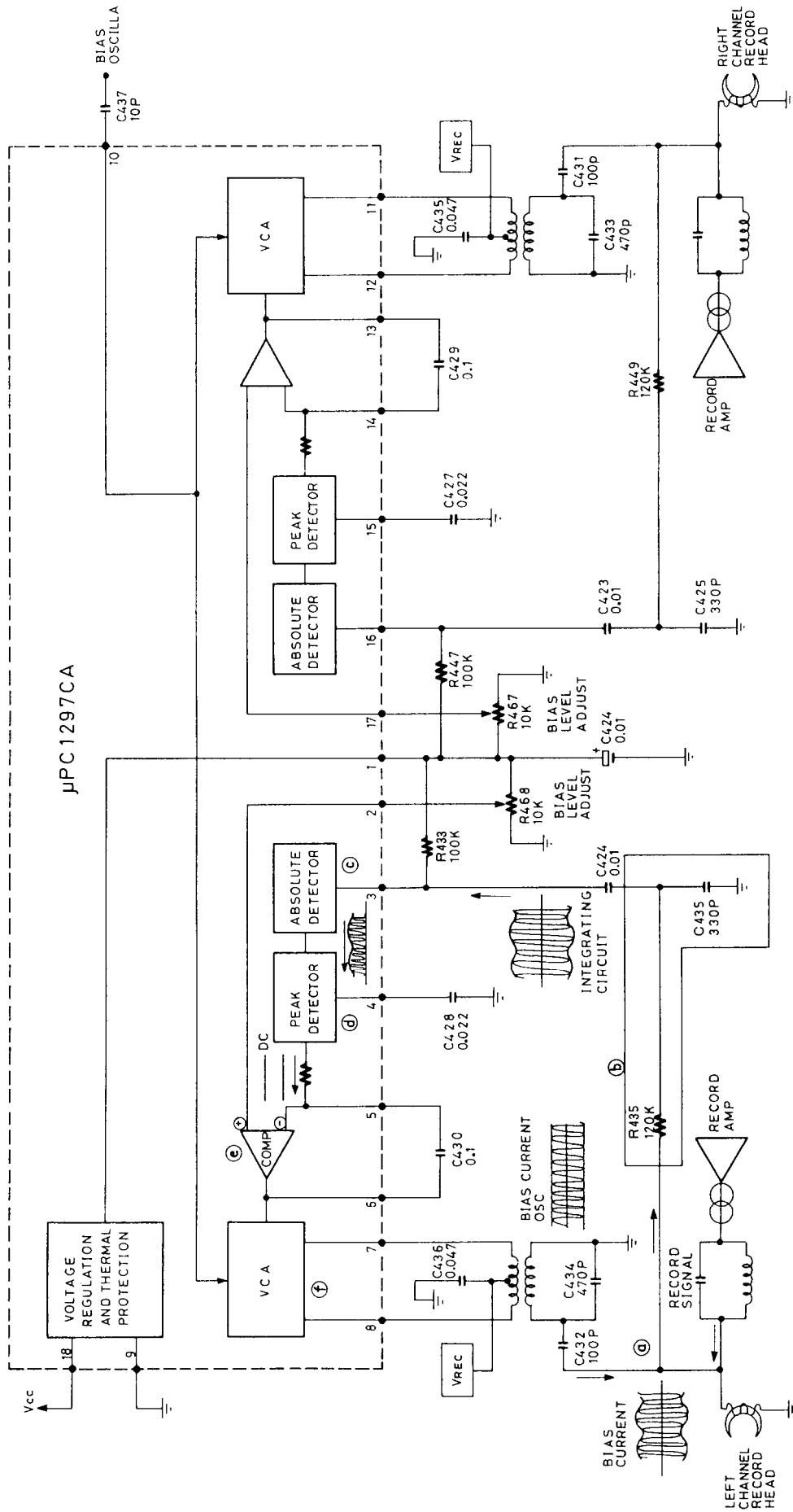
At (a), the time constant (frequency) that is detected in the recording signal is preserved, and above a certain frequency and above a certain level, the VCA controls the bias current by causing its reduction. When this is done, in the manner shown in the explanation of Item 1 above, the frequency high region is raised. With this control, the audio signal is instantaneously dealt with.

3. Regarding the operating conditions of the HX PRO

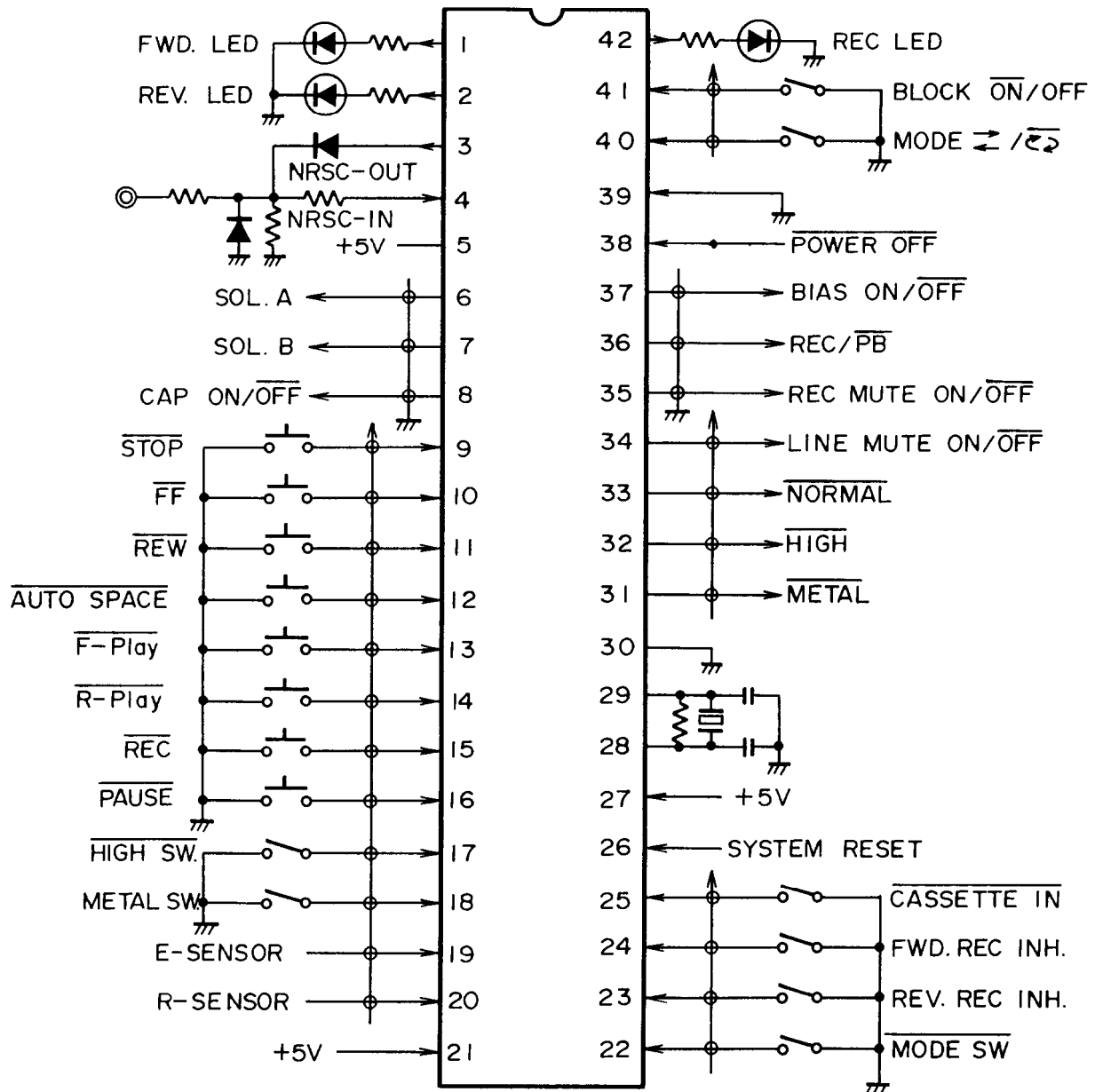
- 1) With equation (2. 1) noted above, the effect begins at the frequency thus determined.

- 2) Above a certain level the effect begins. (Substantially 0 dB: In the vicinity of 500mV line out) The audio signal component level is dependent upon the waveform after point (c).

HX PRO BLOCK DIAGRAM



MICROCOMPUTER (HD614148SA47)



| CIRCUIT NO. | PART NO. | DESCRIPTION |
|----------------------|-----------------------|-------------------------------|
| Resistors | | |
| R115, R116 | 5210066 or 5210218 | N06HR 22KBD or N06HR 20KBD |
| R147, R148 | 5104226 | N11RL50KA17, VR |
| R401, R402 | 5210068 or 5210220 | N06HR 47KBD or N06HR 50KBD |
| R431, R432 | 5210064 | N06HR 10kBD |
| R440 | 5104254 | N11RLC5KB17Z |
| R702 | 49163392404 | 3.9K Ω ×4, 1/10W |
| R736 | 49163392411 | 3.9K Ω ×11, 1/10W |
| R901, R902 | 441520104F | RS1/2WBJ 1 Ω |
| Plugs, Socket | | |
| P101A | 2009990008 | NSAS-20P0014 |
| P102 | 25045165 | NPJ-4PDBL59 |
| P701 | 25045172 | HSJ-1003-01-020 |
| P702A | 2002393030 | NSAS-30P0012 |
| P703A | 2006392030 | NSAS-20P0013 |
| P901A | 2009990011A | NSAS-10P0020 |
| Switch | | |
| S709-S712 | 25035587 | NPS-422-S549 |
| Miscellaneous | | |
| | 27141059 | BRACKET |
| | 27300243 | CLAMP |

NADIS-3639-1

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|-------------------|-------------------------|-------------------------------|
| lc | | |
| Q303, Q304 | 222623 | IR2E02 |
| LED | | |
| D301-D310 | 225137CG or 225137DG | SEL2413E-CG or SEL2413E-DG |
| D311-D316 | 225141 | SEL2213C |
| D711 | 225141 | SEL2213C |
| D712, D713 | 225137CG or 225137DG | SEL2413E-CG or SEL2413E-DG |
| Capacitors | | |
| C305, C306 | 354780479 | 4.7 μ F 50V, ELECT. |
| C307, C308 | 354780109 | 1 μ F 50V, ELECT. |
| Switch | | |
| S701-S708 | 25035548 | NPS-111S510, PUSH |
| Holder | | |
| | 27190722 | LED-19 |

NASW-3640-1

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|------------------|----------|--------------------------|
| Capacitor | | |
| C901 | 3500065A | 0.01 μ F AC400V, IS. |
| Switch | | |
| S901 | 25035558 | NPS-111-L520P |
| Terminal | | |
| | 25060092 | NJM-1S33 |

NAETC-3641-1

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|-----------------|----------|---------------------|
| Terminal | | |
| P301 | 25045255 | YKB21-5009, ST JACK |

ADJUSTMENT PROCEDURES

PRECAUTIONS

- Before adjustment, clean the following parts with an alcohol moistend swab.
 - * record/playback head
 - * pinch roller
 - * erase head
 - * capstan
- Do not use magnetized screwdriver for adjustments.
- Demagnetize record/playback head with a head demagnetizer.

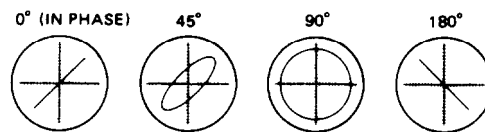
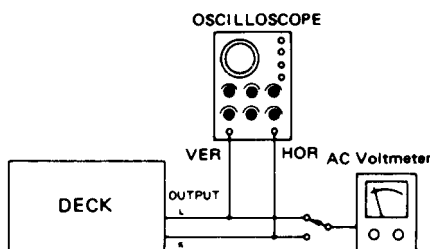
TEST EQUIPMENT/TOOLS REQUIRED:

- Audio oscillator
- Digital frequency counter
- Oscilloscope
- Attenuator
- AC voltmeter
- Non-magnetic screw driver
- 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 | 3020±20Hz | |
| 2 | Head azimuth | AC voltmeter and oscilloscope to Line output terminal | VTT-703L | PB | AC voltmeter | Head azimuth screw | Maximum and same phase at channels L and R | fig-1 |
| 3 | Playback level | AC voltmeter to terminals TP-121 and TP-122 | MTT-150 | PB | AC voltmeter | R115(Ch.L) R116(Ch.R) | 25mV | |
| 5 | OSC Block | Frequency counter to P101a read loose coupling | METAL TAPE MX-C90 | REC | Frequency counter | L-451 | 85kHz±2kHz | |
| 6 | HX-PRO | AC voltmeter to terminals Tp-101 and TP-102 | METAL TAPE | REC | AC voltmeter | L-431(ch.L) L-432(ch.R) | Maximum | R-431 R-432 clock wise |
| 7 | Bias current | fig. 2 | 1kHz, -20dB and 12kHz, -20dB | XL-II C-90 | REC-PB | R431(ch.L) R432(ch.R) | Same level at REC-PB | Input VR maximum. |
| 8 | Record level | fig. 2 | 1kHz | XL-II | REC | AC voltmeter | Attenuator or AF OSC output | 350mV |
| | | | | | REC/Pb | AC voltmeter | R401(ch.L) R402(ch.R) | Same level at REC/PB |

Blank tape

- NORMAL UD-1 C-90
- HIGH XL-II C-90
- METAL MX C-90
- PLAY torque 30~70/cm
- FF.REW torque 80~180/cm
- Back tention 2~7g/cm



Confirming phase relationship fig-1

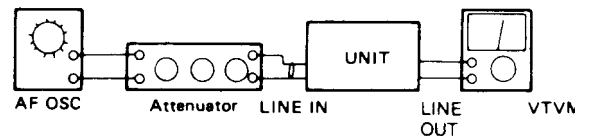
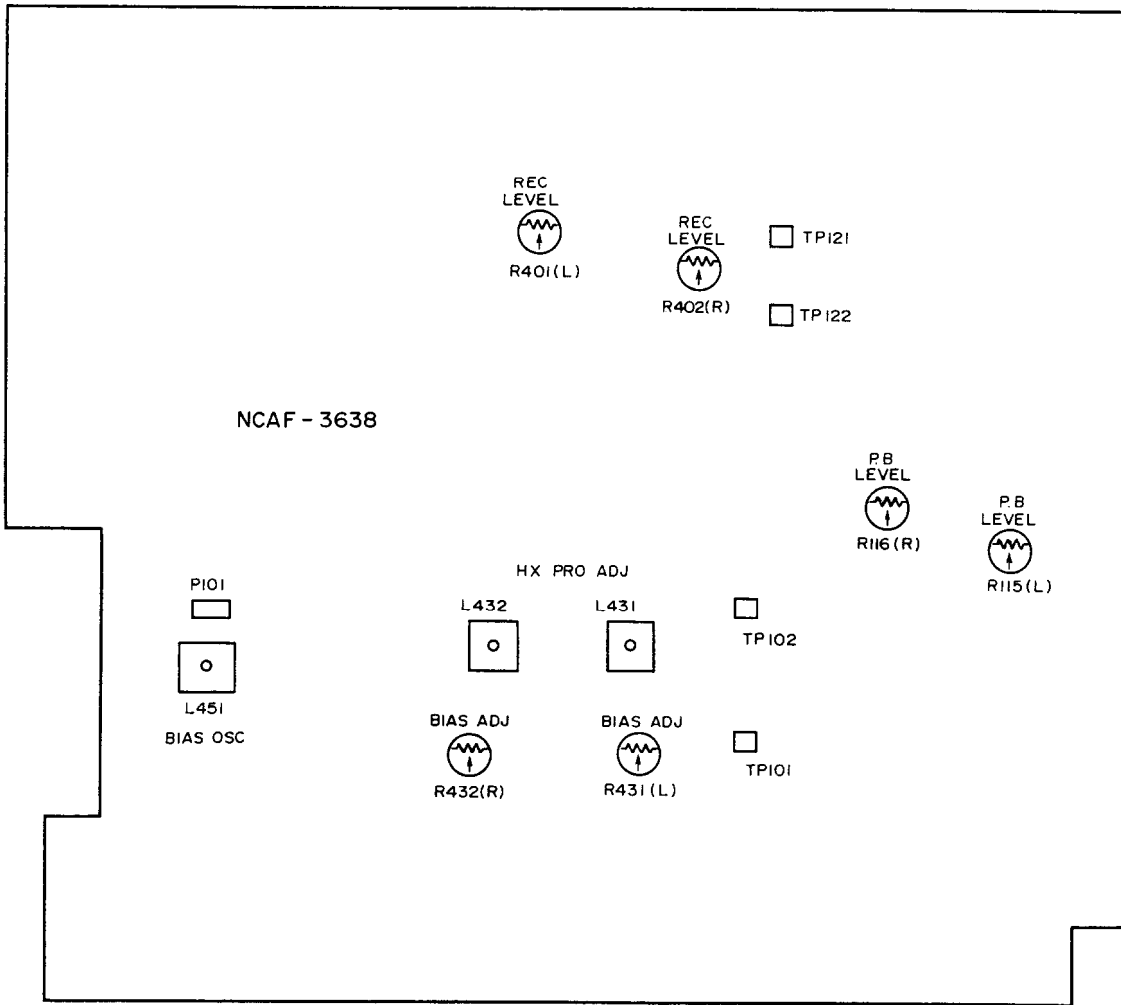
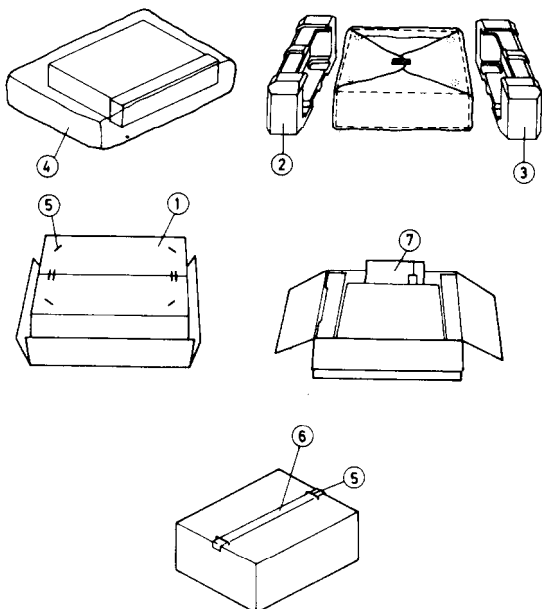


fig-2



PACKING VIEW



PACKING PART LIST

| REF NO. | PART NO. | DESCRIPTION |
|---------|-----------|--------------------------|
| 1 | 29051959 | master carton box |
| 2 | 29091235A | Pad (L) |
| 3 | 29091236A | Pad (R) |
| 4 | 29100037A | 650x500 Poly bag |
| 5 | 282301 | Sealing hook |
| 6 | 260012 | Damp tape |
| 7 | | Accessory bag ass'y |
| | 29341440 | Instruction manual |
| | 2010098A | Connection cable |
| | 29365019 | Waranty card (N) |
| | 29358002G | Service station list (N) |
| | 29100006A | 350x250 Ply bag |
| | 25055018 | CV-K-1 (W) |

NOTE: (N): Only U.S. A. model
(W): Only worldwide model

CHASSIS-EXPLODED NEW PART LIST

| REF.NO. | PART NO. | DESCRIPTION |
|---------|-------------|-------------------------------------|
| A1 | 27110511A | FRONT BRACKET AS |
| A5 | 28323758A | KNOB (EJ) |
| A6 | 27273056-1A | JOINT |
| A8 | 27180333-1 | SPRING (T2) |
| A9 | 28400282 | DAMPER |
| A11 | 28400504 | CASSETTE LID AS |
| A11a | 28400505 | FRAME (CASSETTE) |
| A11b | 28400502 | CASSETTE LID |
| A11c | 27180272 | SPRING (CA) |
| A11d | 28400503 | WINDOW |
| A14 | 27100184C | CHASSIS |
| A15 | 27190266 | HOLDER |
| A16 | 27121284 | BACK PANEL (D) |
| | 27121284-1 | BACK PANEL (W) |
| | 27121284-2 | BACK PANEL (Q) |
| A17 | 27300750 | BUSHING (CORD) |
| A18 | 27141351 | BRACKET (ZE) |
| A19 | 86414010 | FLANGE NUT FWN4×10FN |
| A21 | 27273122 | JOINT (POW) |
| A22 | 24601234 | TAPE COUNTER |
| A26 | 834430088 | TAP-TIGHT SCREW 3TTS+8B(BC) |
| A27 | 833430080 | TAP-TIGHT SCREW 3TTP+8P(BC) |
| A28 | 831130088 | TAP-TIGHT SCREW 3TTW+8B |
| A29 | 830440089 | TAP-TIGHT SCREW 4TTC+8C(BC) |
| A30 | 831430100 | TAP-TIGHT SCREW 3TTW+10P(BC) |
| A31 | 838440089 | TAP-TIGHT SCREW 4TTB+8C(BC) |
| A52 | 838130108 | TAP-TIGHT SCREW 3TTB+10B |
| A301 | 28184388 | TOP COVER |
| A306 | 28133227 | BACK PLATE |
| A307 | 28191520A | CLEAR PLATE |
| A501 | 1N072121 | FRONT PANEL |
| A631 | 27175219A | LEG |
| A810 | 28323759 | KNOB (PUSH) |
| A811 | 28323241-1A | KNOB (POW) |
| A815 | 28323297 | KNOB (VOL) |
| P901 | 253099C | ACCORD, AS-UC3 (D) |
| | 253148 | ACCORD, AS-CEE (W) |
| | 253118 | ACCORD, AS-SAA (Q) |
| T901 | △ 2300474 | NPT-1041D (D) |
| | △ 2300476 | NPT-1041DG (W) |
| | △ 2300477 | NPT-1041Q (Q) |
| S902 | △ 25065123 | NSS-1258P (W) |
| U1 | 1N072538-1 | NAAF-3638-1 |
| U2 | 1N072539-1 | NADIS-3639-1 |
| U3 | 1N072540-1 | NASW-3640-1 |
| U4 | 1N072541-1 | NAETC-3641-1 |
| U5 | 1N072542-1 | NAETC-3642-1 |
| U6 | 1N072542-1A | NAETC-3642-1A (W) |
| Z1 | 244129A | CASSETTE DECK MECAHNISM, NDM-121 |

NOTE: [D]: Only 120V models
[W]: Only 120V/220V models
[Q]: Only 240V models

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

TAPE MECHANISM PART LIST

| REF.NO. | PART NO. | DESCRIPTION | REF.NO. | PART NO. | DESCRIPTION |
|---------|----------|-----------------------------------|---------|-----------|-----------------------|
| 1 | 24606374 | HALL IC, DN6851A | 69 | 24602508 | GEAR (CAM) |
| 2 | 24601251 | CAPSTAN MOTOR AS (NO.2, NO.18) | 70 | 24611409 | HOLDER (HEAD) |
| 3 | 24606375 | LEAF SWITCH | 71 | 24602509 | GEAR (HEAD) |
| 4 | 24606376 | LEAF SWITCH | 72 | 24607114 | ARM (EJECT) 2 |
| 5 | 24602492 | TENSION AS | 73 | 24603375 | LEVER (SELECT) |
| 6 | 24602512 | FLYWHEEL | 74 | 24611410 | BRAKE |
| 7 | 24602493 | CAM (GEAR) | 75 | 24604097 | TUBE |
| 8 | 24602494 | CAP (REEL) | 76 | 24603376 | LEVER (LATCH) L |
| 9 | 24607104 | ARM (FR) | 77 | 24602510 | METAL |
| 10 | 24602495 | PINCH ROLLER AS (L) | 78 | 24602511 | METAL |
| 11 | 24602496 | PINCH ROLLER AS (R) | 79 | 24611411 | CUSHION |
| 12 | 24602497 | GEAR | 80 | 24607115 | ARM (TRIGGER) |
| 13 | 24602498 | GEAR (H) | 81 | 24606379 | PLUNGER |
| 14 | 24607105 | ARM (QUE) | 82 | 24606380 | BOBBIN |
| 15 | 24609021 | SCREW | 83 | 24606381 | PLATE AS |
| 16 | 24609022 | SCREW | 85 | 24609024 | SCREW |
| 17 | 24604095 | COLLAR | 86 | 24605736 | SPRING |
| 18 | 24602499 | PULLEY | 87 | 24604098 | COLLAR |
| 19 | 24602500 | BELT | 88 | 24602491 | COUNTER BELT |
| 20 | 24605719 | SPRING | 89 | 24609025 | SCREW |
| 21 | 24605720 | SPRING | 90 | 24606382 | BOBBIN |
| 22 | 24605721 | SPRING | 91 | 24609026 | SCREW |
| 23 | 24605722 | SPRING | 92 | 24605737 | SPRING WASHER |
| 24 | 24605723 | SPRING | 93 | 24607109 | BRACKET (EJECT) |
| 25 | 24604096 | COLLAR | 94 | 24607110 | ARM (EJECT) |
| 26 | 24611400 | HOUSING | 95 | 24611412 | HOLDER |
| 27 | 24605724 | SPRING | 96 | 24606383 | DIODE |
| 28 | 24605725 | SPRING | 97 | 24606384 | DIODE |
| 29 | 24605726 | SPRING | 98 | 24606385 | PRINTED CIRCUIT BOARD |
| 30 | 24605727 | SPRING | 99 | 24606386 | WIRE |
| 31 | 24605728 | SPRING | 200 | 863126 | NUT N-2.6F |
| 32 | 24605729 | SPRING | 201 | 893020 | E WASHER E2 |
| 33 | 24605730 | SPRING | 202 | 833120067 | TAP-TIGHT SCREW M2×6 |
| 34 | 24605731 | SPRING | 203 | 24611413 | WASHER |
| 35 | 24605732 | SPRING | 204 | 24611414 | WASHER |
| 36 | 24605733 | SPRING | 205 | 24609027 | SCREW |
| 37 | 24609023 | SCREW | 206 | 24611415 | WASHER |
| 38 | 24602501 | GEAR (FLYWHEEL) | 207 | 83112652 | SCREW |
| 39 | 24606389 | PRINTED CIRCUIT BOARD | 209 | 24611416 | WASHER |
| 40 | 24606390 | LEAD WIRE | 210 | 24611417 | WASHER |
| 41 | 24606377 | PRINTED CIRCUIT BOARD | 211 | 833120047 | SCREW 2TTP+4S |
| 42 | 24606378 | LEAD WIRE | 212 | 24611418 | WASHER |
| 43 | 24611399 | HOUSING | 213 | 24611419 | WASHER |
| 45 | 24611401 | CHASSIS | 214 | 24611420 | WASHER |
| 46 | 24602502 | REEL AS (R) | 215 | 24609028 | SCREW |
| 47 | 24602503 | REEL AS (L) | 216 | 24609029 | SCREW |
| 48 | 24607106 | ARM AS (REVERSE) | 217 | 24611421 | WASHER |
| 49 | 24603372 | LEVER AS (FR) | 301 | 24600092 | HEAD AS |
| 50 | 24603373 | LEVER AS (PLAY) | | | |
| 51 | 24607107 | ARM AS (GEAR) R | | | |
| 52 | 24607108 | ARM AS (GEAR) L | | | |
| 53 | 24603374 | LEVER AS (HEAD) | | | |
| 54 | 24602513 | FLYWHEEL | | | |
| 55 | 24611402 | CHASSIS (HEAD) | | | |
| 56 | 24611403 | PLATE (FW) | | | |
| 57 | 24611404 | PLATE (AZIMUTH) | | | |
| 58 | 24607111 | ARM (SW) | | | |
| 59 | 24602504 | GEAR (FLYWHEEL) | | | |
| 61 | 24607112 | ARM (HEAD) | | | |
| 62 | 24605734 | SPRING (AZIMUTH) | | | |
| 63 | 24605735 | SPRING (CASSETTE) | | | |
| 64 | 24607113 | ARM (TRIGGER) | | | |
| 65 | 24611405 | FRAME (HEAD) | | | |
| 66 | 24611406 | GUIDE (CASSETTE) L | | | |
| 67 | 24611407 | GUIDE (CASSETTE) R | | | |
| 68 | 24611408 | GUIDE (CASSETTE) | | | |

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TAPE MECHANISM-EXPLODED VIEW

