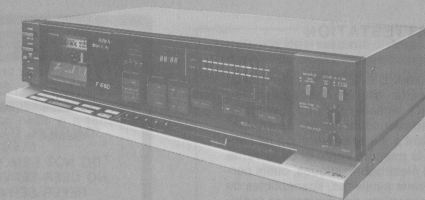


# AIWA®

MODEL NO. **AD-F660E,H,K,G,U,C,Z**

**STEREO CASSETTE DECK**

- OPERATING INSTRUCTIONS
- BEDIENUNGSANLEITUNG
- INSTRUCCIONES DE MANEJO
- ISTRUZIONI PER L'USO
- MODE D'EMPLOI



## OWNER'S RECORD

For your convenience, record the model number and serial number (you will find them on the rear of your set) in the space provided below. Please refer to them when you contact your AIWA dealer in case of difficulty. This will be a great help to you in getting better and more satisfactory service on your set.

Model No. AD-F660 E, H, K, G, U, C, Z

Serial No.

### WARNING:

DO NOT PREVENT FIRE OR SHOCK HAZARD,  
DO NOT EXPOSE THIS APPLIANCE TO  
RAIN OR MOISTURE.

### ATTESTATION

La Société AIWA Co., LTD. atteste que le Magnétocassette stéréo, acceptant les bandes "métal". Modèle AD-F660 E est conforme aux dispositions de l'arrêté de 14 Janvier 1980 relatif à la réglementation de l'importation, de la mise en vente et de la vente des appareils électrodomestiques, outils portatifs et appareils similaires, susceptibles de perturber la réception des émissions radio-électriques.

## MAIN FEATURES

- A built-in DOUBLE DOLBY NR Type-C assures a maximum improvement of 20 dB in the S/N ratio.
- A built-in ACTIVE SERVO BIAS system, DOLBY HX PRO, improves substantially the high-frequency dynamic range.
- A three-head system consists of combination DX heads.
- AUTO TAPE selector for automatic detection of the type of tape used.
- AUTO REC-MUTE mechanism for automatic blank space recording between selections on the tape.
- NORMAL, CrO<sub>2</sub>, BIAS FINE adjustment knob provided to finely adjust the recording bias suitable to NORMAL, CrO<sub>2</sub> tapes.
- Full logic, microcomputer-controlled tape transport buttons.
- TIMER PLAY/REC switch for unattended recording or wake-up playback.
- Intro play mechanism for facilitating program search.
- Equipped with remnant tape indicator, which indicates the remnant tape length not only in the playback and recording modes, but also in the fast forward and rewind modes.
- Exclusive AIWA ADMS (Auto De-magnetizing System) automatically removes head magnetization each time power is switched on.

### Note:

Please check the laws on copyright relating to recordings from discs, radio or external tape for the country in which the machine is being used.



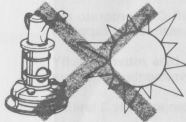
### CAUTION

RISK OF ELECTRIC SHOCK  
DO NOT OPEN



"CAUTION: TO REDUCE THE RISK OF  
ELECTRIC SHOCK,  
DO NOT REMOVE COVER (OR BACK).  
NO USER-SERVICEABLE PARTS INSIDE.  
REFER SERVICING TO QUALIFIED  
SERVICE PERSONNEL."

[Fig. 1], [Abb. 1]



[Fig. 2], [Abb. 2]



[Fig. 3], [Abb. 3]



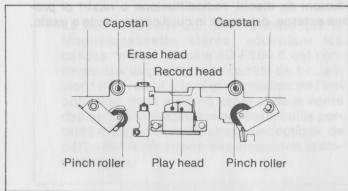
[Fig. 4], [Abb. 4]



[Fig. 5], [Abb. 5]



[Fig. 6], [Abb. 6]



## OPERATING PRECAUTIONS

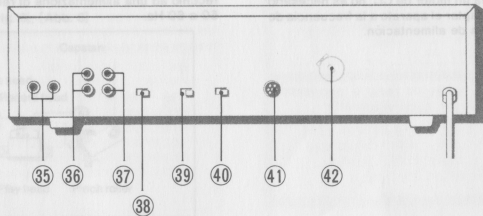
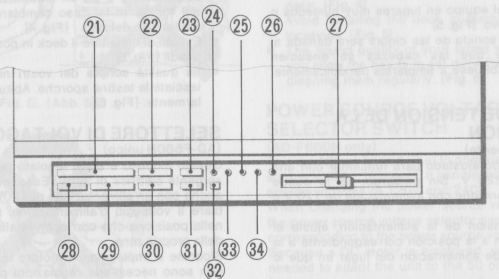
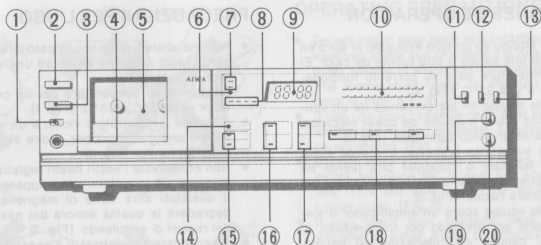
- Do not install your deck in a location where it will be exposed to the sun or where it is near a stove or any other source of extremely high temperatures. The temperature range for the correct use of this deck is from 5°C to 35°C. [Fig. 1]
- If you use your cassette deck near an electric fan or an electric sewing machine, a humming noise may be generated. [Fig. 2]
- Do not store your recorded tapes near a magnet, motor, television set, or near any source of magnetism. This will downgrade the sound quality and cause noise. [Fig. 3]
- If you stack your cassette deck on top of an amplifier or tuner, it may be affected by hum. If this happens, change the installation location of the deck. [Fig. 4]
- Avoid installing the deck in dusty and very humid locations. [Fig. 5]
- The sound quality of your tapes will be impaired if you allow the heads to get dirty. Get into the habit of cleaning them regularly. [Fig. 6]

## POWER SOURCE VOLTAGE SELECTOR SWITCH

(AD-F660H only)

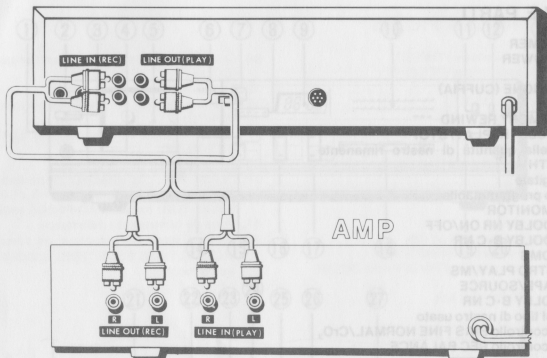
This model has been preset to operate on a 220V power source voltage. However, it can be set to work on power source voltages of 120V and 240V.

When changing the power source voltage setting, set the power source voltage selector switch to the position corresponding to the power source voltage of your area. Because a DC motor is employed, no adjustments are needed to adapt the unit to the 50 or 60 Hz power line frequency.



## NAMES OF PARTS

1. TIMER switch
2. POWER switch
3. EJECT button
4. HEADPHONE jack (PHONES)
5. Cassette compartment
6. MEMORY REWIND indicator
7. "0000" REPLAY/STOP indicator
8. TAPE LENGTH indicator
9. Digital counter
10. Peak program meter
11. MONITOR switch
12. DOLBY NR ON/OFF switch
13. DOLBY B-C NR switch
14. ADMS indicator
15. INTRO PLAY/MS indicator
16. TAPE/SOURCE indicator
17. DOLBY B-C NR indicator
18. Tape position indicator
19. BIAS FINE NORMAL/CrO<sub>2</sub> control knob
20. REC BALANCE control knob
21. STOP button
22. PAUSE button
23. REC MUTE button
24. "0000" reset switch
25. MEMORY REWIND switch
26. TAPE LENGTH switch
27. RECORD LEVEL control knob
28. REW REVIEW/MS button
29. PLAY button
30. FFW CUE/MS button
31. RECORD button
32. MUSIC SENSOR switch
33. REPLAY/STOP switch
34. COUNTER/TAPE TIME switch
35. MIC jack
36. LINE IN/REC jacks
37. LINE OUT/PLAY jacks
38. MPX FILTER switch
39. Headphone level selector switch
40. CrO<sub>2</sub>/Co SELECTOR switch (AD-660Z model only)
41. Remote control jack
42. AC VOLTAGE SELECTOR switch (AD-F660H model only)



[Fig. 7], [Abb. 7]

Shown above is AD-F660H.

## CONNECTIONS [Fig. 7]

### LINE OUT/PLAY jacks

These are the jacks through which the playback sound is conducted. Use the stereo pin cords to connect them to the TAPE PLAY (or LINE IN, AUX IN) jacks on the amplifier (or receiver).

### LINE IN/REC jacks

These are the jacks that feed in the sound from the sound source (tuner, stereo amplifier, etc.) which you want to record. Use the stereo pin cords to connect them to the TAPE REC (or LINE OUT) jacks on the sound source which you want to record.

#### Note:

- The MIC jacks take priority when the LINE IN/REC jacks and MIC jacks are connected at the same time.

### MIC jack

This jack accommodates microphones with an impedance ranging from 200 ohms to 10 k-ohms. If you are recording in stereo with two microphones, use unidirectional models and you will obtain recordings with a superior channel separation.

### Headphone (PHONES) jack

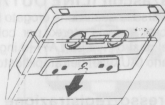
For connection of headphones with 8ohms to 1 kohm impedance.

The volume can be set to two different levels with the HEADPHONE LEVEL switch on the backside of the machine.

### REMOTE CONTROL jack

This jack is for remote control of this set. Please connect to the remote controller RC-11 (optional).

[Fig. 8], [Abb. 8]



## BEFORE SWITCHING ON THE POWER

Make sure the **TIMER** switch is set to the **OFF** position, except in the case of unattended recording. If set to **REC.**, switching on the power will start recording.

## POWER SUPPLY

Plug the AC cord on the back of the unit into an AC wall outlet, depress the **POWER** switch to turn on the power. Depress once more to turn the power off.

## INSERTING CASSETTES [Fig. 8]

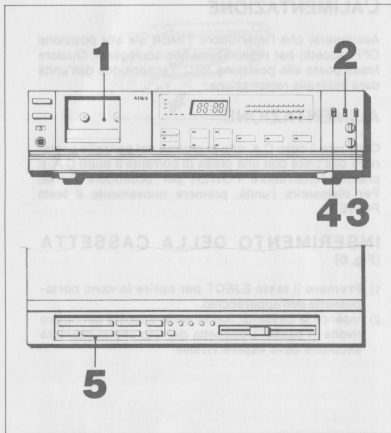
- 1) Press the **EJECT** button to open the cassette holder.
- 2) Insert the cassette with the exposed section of the tape pointing downwards. The label of the side desired for play should be visible to the user.

\* The MIC jacks take priority when the **LINE IN/REC** jack is connected. See the **REC/MIC** jack label.

### MIC jack

This jack accommodates microphones as well as impedance matching units. If you wish to match 10 to 100 ohm microphones, use the unit with the microphone impedance matching unit. You can also connect a microphone with an impedance matching unit to the MIC jack.

[Fig. 9], [Abb. 9]



## TAPE PLAY [Fig. 9]

1. Insert a cassette with the side intended for play facing outwards.
2. Set Dolby noise reduction position to ON or OFF.
3. If listening with Dolby NR, select B or C position.
4. Set MONITOR switch to TAPE, making sure "TAPE" indicator lamp lights to confirm setting.
5. Press the PLAY button.

### Full automatic stop

When the tape reaches its end in any mode of play (playback, recording, rewind or fast forward), the automatic stop mechanism disengages the drive mechanism and returns all controls to neutral.

### Safety lock mechanism

The cassette deck is provided with a safety lock mechanism which renders the operating buttons inoperative even if they are depressed when the cassette compartment is open. This prevents failures due to erroneous operation.

## OPERATING CONTROLS

- \* REW..... This is used to rewind the tape.
- \* PLAY..... This is used when recording or playing back a tape.
- \* F FWD..... This is used to transport the tape forward at high speed.
- \* STOP..... This is used to stop the tape.
- \* PAUSE..... This is used to temporarily stop the tape. Depress it again to release it.

### Ejecting the tape

Depress the EJECT key. The cassette holder opens and you can then remove the cassette.

## MUSIC SENSOR (MS)

The MS system locates blank section on the tape before and after recorded selections, and automatically stops fast forward or rewind operation start to playback. Through this operation, selections located several selections ahead or behind the one being played back, can easily be located and enjoyed without tedious tape search. This function is useful when playing back single among recordings, etc.

### OPERATION

1. Turn on the MS indicator by pressing the music sensor switch.
2. When locating the start of the program now being heard, press the PLAY button and REW button simultaneously. When locating the start of the next program, press the PLAY button and FFWD button simultaneously.

### IMPORTANT

Under the following conditions, the MS function may not operate properly. Note that these symptoms do not indicate any malfunction of the system.

- Selections containing extended pianissimo (low volume) or if the blanks before and after recorded selections are extremely long.
- Tapes on which blank recordings between recorded selections are less than 4 seconds.
- Tapes on which noise and hum is present in the blank segments.
- Tapes with low recording levels of recorded selections.
- Low cost tapes and tapes with poor casing precision.
- Turn "OFF" the music sensor switch (both the MS indicator and the INTRO PLAY indicator are off) when the INTRO PLAY and the MS are not being used.
- The "000" REPLAY and "000" STOP functions do not work during MS and INTRO PLAY modes.
- The music sensor switch is changed over in the following order. "OFF"—"INTRO PLAY"—"MS".

## ASCOLTO DEL NASTRO

1. Introdurre una cassetta col lato che si desidera ascoltare rivolto verso l'altoparlante.
2. Premere l'interruttore Dolby di riduzione del rumore sulla posizione ON-OFF.
3. Premere l'altoparlante con il sistema Dolby di riduzione del rumore e premere il tasto B o C.
4. Premere il tasto di memoria su TAPES e premere il tasto che si vuole "TAPES" si applicano per confermare la memorizzazione.
5. Premere il pulsante di riproduzione (PLAY).

### Arresto completamente automatico

Quando il nastro giunge in qualsiasi modo (avanti o indietro, ascolto, registrazione ecc.) alla sua fine, il sistema automatico di arresto blocca il motore e riporta il pulsante in posizione neutrale.

### Blocco di sicurezza

Il registratore è costruito a livello di un blocco di sicurezza che impedisce tutti i funzionamenti non richiesti (avanzamento, arretramento, ecc.) e impedisce il funzionamento a cassetta con tutte le parti del sistema sotto il funzionamento.

5

## TASTI DI FUNZIONAMENTO

1. Arretramento (REW) Per rinvoltare il nastro.
2. Avanzamento (PLAY) Per registrare o ascoltare un nastro.
3. Avanzamento rapido (FFWD) Per far avanzare il nastro ad alta velocità.
4. Arresto (STOP) Per arrestare il nastro.
5. Pausa (PAUSE) Per arrestare temporaneamente il nastro. Premendo una seconda volta per sbloccarlo.

### Espulsione del nastro

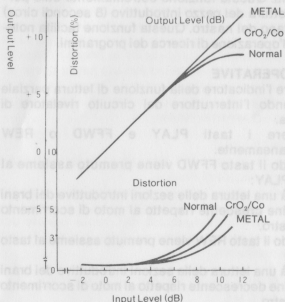
Premere il tasto d'espulsione (EJECT). Il vano cassetta si apre rendendo possibile l'estrazione della cassetta.

### Expulsión de la cinta

Premere el botón de expulsión (EJECT). El portacassetes se abre y usted podrá retirar la cinta.



[Fig. 10], [Abb. 10]



## BEFORE RECORDING

### Utilizing the optical peak display [Fig. 10]

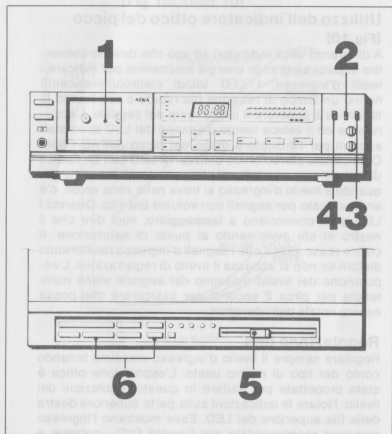
Unlike needle-type meters which must convert electrical pulses to mechanical energy to display input levels, LEDs (light emitting diodes) feature a faster reaction time and do not tend to "overshoot" the actual signal level. The accuracy and rapid attack time of LEDs has been put to use in the AD-F660's optical peak display. Each stereo channel utilizes 12 LEDs which are color-coded for easier reading. Generally, when the input level is in the green zone, headroom is still available for higher volume signals; when the yellow LEDs begin to flash, it indicates the tape is approaching its saturation level; and red would indicate that the input signals will distort unless the record level is lowered. Display of the highest signal level is retained for approximately two seconds to ensure it can be monitored by the recordist.

### Fine adjustments

Always set the maximum input level to take into account the type of tape being recorded. The optical display has been designed to assist in these level adjustments. Note the lettering at the upper right of the top row of LEDs. These show the maximum recommended input for CrO<sub>2</sub>, NORMAL and METAL tapes.

Following the above instructions will result in better quality recordings with a high signal/noise ratio and minimal distortion.

[Fig. 11], [Abb. 11]



## RECORDING [Fig. 11]

1. Load the tape.
2. Select the Dolby NR ON/OFF switch position.
3. Select the Dolby NR B - C switch position.
4. Set the MONITOR button to source.
5. Adjust the recording level.
6. Recording starts when the RECORD and PLAY buttons are depressed.

## FINE ADJUSTMENT OF BIAS [Fig. 19, 20]

The thickness and magnetic properties of tapes vary among manufacturers, and the large number of different brands of Noraml/CrO<sub>2</sub> tape in particular complicate the correct matching of tape with the deck's bias characteristics.

If you are using a tape whose bias position is not given in the figure, record FM interstation noise at about -20 VU, set the monitor switch alternately to TAPE and SOURCE, and adjust the bias so that the sound quality is made the same. The bias is now set appropriately.

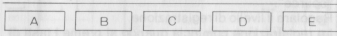
- There may be slight discrepancies even with tapes of the same brand.
- The bias fine control does not work during playback, nor does it function in the METAL setting.

## REC BALANCE KNOB

This is normally kept to the center position. When there is no balance between the sound in the left and right channels of the source to be recorded or when you want to vary the sound positionality at the left or right, rotate this control and adjust as required.

[Fig. 12], [Abb. 12]

- 1) Reset counter to "0000" at start of tune "B".  
Am Anfang von Programmstelle "B" das  
Zählwerk auf "0000" zurückstellen.  
Ramenez le compteur à "0000" au début du  
morceau "B".  
Reponer el contador a "0000" al principio  
de la canción "B".  
Riportare il contatore a "0000" all'inizio del  
motivo "B".



[Fig. 13], [Abb. 13]

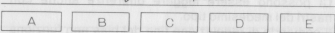


Tape rewinds  
Das Band wird zurückgespult  
La bande est rembobinée.  
La cinta se rebobina.  
Il nastro si riavvolge

[Fig. 14], [Abb. 14]

● REPLAY

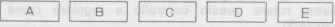
Playback  
Wiedergabe  
Lecture  
Reproduzione  
Riproduzione



Unit will begin to play back tape from start of  
tune "B".  
Wiedergabe beginnt am Anfang von  
Programmstelle "B".  
La lecture commence à partir du morceau "B".  
El aparato iniciará la reproducción de la  
cinta desde el principio de la canción "B".  
La riproduzione del nastro ricomincerà  
dall'inizio del motivo "B".

[Fig. 15], [Abb. 15]

● STOP



Tape will remain stopped at start of tune "B".  
Das Band hält am Anfang von  
Programmstelle "B".  
La bande s'arrête au début du morceau "B".  
La cinta permanecerá parada al inicio de la  
canción "B".  
Il nastro rimane fermo all'inizio del  
motivo "B".

## MEMORY FUNCTION

This enables you to rewind the tape either from the record or playback position and playback the desired segment once again.

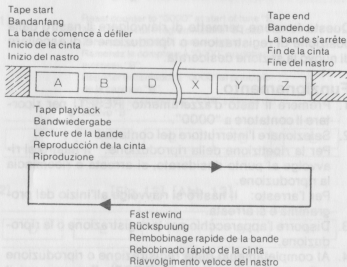
### Operation

1. Press RESET button to set display to "0000".
  2. Select counter switch.  
For replay: Tape will rewind to desired point, stop and play it back.  
For stop: Tape will rewind to start of program segment and halt.
  3. Set deck to record or playback.
  4. After recording or playback is completed, press STOP button. Then press REW/REVIEW button.
  5. When the tape counter reaches "0000", unit will function in accordance with counter switch position.  
If set to REPLAY: Playback will resume from "0000".  
If set to STOP: Tape motion will halt and mechanism will remain disengaged.
- Please be sure to set COUNTER switch to OFF when not utilizing the MEMORY function.
- 1) Example: You want to stop the tape at tune "F" and return to repeat playback from tune "B". [Fig. 12]
  - 2) Upon completion of tune "F", press STOP and REWIND button. [Fig. 13]
  - 3) For REPLAY [Fig. 14]  
For STOP [Fig. 15]

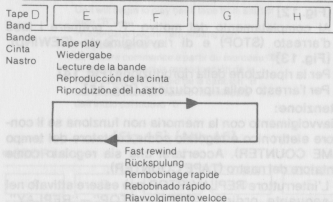
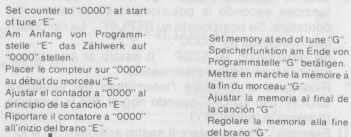
### Caution:

- Memory rewind will not function if the electronic counter is in the TIME COUNTER setting. Be sure and return setting to TAPE COUNTER.
- The REPLAY/STOP switch is changed over in the following order. "OFF"—"STOP"—"REPLAY". Keep it pressed until switching to the position aimed at.

[Fig. 16], [Abb. 16]



[Fig. 17], [Abb. 17]



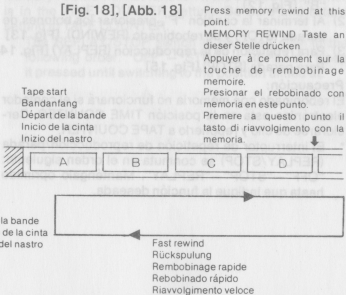
## WAYS TO USE MEMORY/REPEAT FUNCTIONS

- To repeat play of one side of the tape [Fig. 16]
  1. Play tape according to previous instructions.
  2. Set timer switch to PLAY/REPEAT position.
- When the tape reaches its end, it will be rewound automatically back to the start and play will repeat.
- Set REPLAY/STOP switch to OFF during this operation.
- For repeat play between the tape start and a particular segment midway [Fig. 17]
  1. Set REPLAY/STOP switch to OFF.
  2. Set TIMER switch to PLAY/REPEAT.
  3. When tape reaches point from which repeat playback is desired, press MEMORY REWIND switch.
- Whether the REW/REVIEW button is pressed midway or whether the tape is permitted to play all the way to the end, the tape will rewind automatically. Then play will be repeated between the tape start and the point where the MEMORY REWIND switch was pressed.
- Replay of a specific segment on the tape [Fig. 18]
 

Example: You wish to repeat play of tune "E", "F" and "G" only.

  1. At start of tune "E", reset counter to "0000".
  2. Set REPLAY/STOP switch to REPLAY.
  3. At the end of tune "G", press MEMORY REWIND switch to set memory.
  4. When REWIND button is pressed, the tape will wind back to the start of tune "E" and then commence repeat play of tunes "E" through "G".

[Fig. 18], [Abb. 18]



[Fig. 19], [Abb. 19]

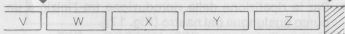
Set counter to "0000" at start of tune "W".

Zählwerk auf "0000" am Anfang von Programmstelle "W" stellen.

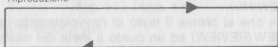
Ramener le compteur sur "0000" au début du morceau "W".

Ajuster le compteur a "0000" al principio de la canción "W".  
 Riportare il contatore a "0000" all'inizio del brano "W".

Tape end  
 Bandende  
 Fin de la bande  
 Final de la cinta  
 Fine del nastro



Tape play  
 Wiedergabe  
 Lecture de la bande  
 Reproducción de la cinta  
 Riproduzione



Fast rewind  
 Rückspulung  
 Rimbobine rapido  
 Retobinado rápido  
 Riavvolgimento veloce

- For repeat play between midway segment and tape end [Fig. 19]

1. At the start of point from which repeat play is desired, reset counter to "0000".
  2. Set REPLAY/STOP switch to REPLAY.
  3. Set TIMER switch to PLAY/REPEAT.
- \* When tape play reaches the end, press the REWIND button. Deck will rewind tape to start of desired passage and repeat play between passage and tape end.

## AUTO REC-MUTE

During recording, if the REC MUTE button is pressed, all input signals will not be recorded for approximately four seconds, leaving a blank segment on the tape. This is a useful function for "editing" tapes by creating uniform blank spaces between recorded passages.

- For blank segments of less than four seconds  
 After pressing the REC MUTE button, press it once again quickly (i.e., within the four second period) and Rec-mute operation will stop.
- For blank segments of more than four seconds  
 Hold in the Rec-mute button for as long as desired. When button is released, normal recording will continue.
  - \* Rec-mute indicator will flash at approximately 1-2 second intervals (after the first four seconds have passed)

[Fig. 20], [Abb. 20]

SONY-EHF, CD- $\alpha$  UCX  
FUJI-FR1  
SCOTCH-Master II  
TDK-SA, SA-X  
BASF-chromdioxide II  
AMPEX-Grand Master II  
TDK-D  
SONY-HFX, BHF  
BASF-professional-I  
FUJI-DR, ER  
AMPEX-Grand Master I  
AGFA-LNS, Super-Ferro  
maxell-XL  
MEMOREX-MRXI

MEMOREX-HIGH  
BIASII  
maxell-UL  
SONY-LNX, CHF  
BASF-performance  
AGFA-Ferro color  
PHILIPS-Ferro

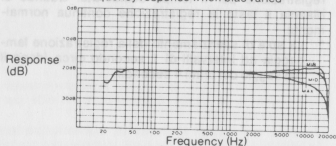


SONY-UCX-S  
maxell-XLII, XLII-S  
BASF-professional-II  
TDK-OD  
maxell-UD, XLI-S  
SCOTCH-DYNARANGE,  
MASTER-I  
FUJI-FR-I

BASF-chromdioxide  
super II  
TDK-AD, AD-X  
SONY-SHF, AHF

[Fig. 21], [Abb. 21]

Frequency response when bias varied



## TAPE REMAINING TIME

This function indicates the remaining recording time of the tape in minutes and seconds.

### How to use this function

1. Press the TAPE LENGTH switch to select the correct tape length. The TAPE LENGTH indicator corresponding to the type of tape being used will light.

Type of tape	Position of the TAPE LENGTH indicator
C-120	C-120
C-90, C-80	C-90
C-60, C-50, C-46, C-30, C-15	C-60 (46)
C-46 large hub	C-46L

2. Press the COUNTER/TAPE TIME switch.  
(The digital counter goes off, a built-in microcomputer calculates the remaining time and after approximately 6 seconds, the digital counter shows the remaining time.)
  - When the TAPE LENGTH switch is pressed, the TAPE LENGTH indicators will light in the following sequence: C-60 (46), C-90, C-120 and C-46L (large hub).
  - Note that there are two types of C-46 tapes: ordinary-sized hubs and large-sized hubs (C-46L).
  - When either the REW REVIEW/MS button or the FFWWD CUE/MS button is pressed while the digital counter indicates the remaining time of the tape, that time is indicated in minutes.
  - When the type of tape is selected by pressing the TAPE LENGTH switch after the display indicates a time of a tape, the new remaining time will be indicated after approximately 6 seconds.

## Accuracy of the tape remaining time

The value of the tape remaining time indicated by the digital counter is subject to errors even in the case of tapes with the same length. This is due to the tape thickness, hub size, uneven tape winding, etc.

Type of tape	Error (max.)	
	Beginning of tape	End of tape
C-120	5 min.	40 sec.
C-90	3 min.	20 sec.
C-60, C-46, C-46L	2 min.	20 sec.

- For C-120 tapes, the maximum error is 5 minutes at the beginning of the tape. That error decreases as the tape advances, reaching a maximum of 40 seconds at the end of the tape.
- The tape remaining time becomes "0000" approximately 15 seconds before the tape actually ends.

### NOTES:

- **MEMORY REWIND, "0000" REPLAY and "0000" STOP** functions are inhibited when the tape time is being indicated.
- There is some discrepancy between the tape remaining time indicated at the beginning of a tape when it is rewound from its end, and the tape remaining time indicated when the tape is directly selected from that condition to PLAY mode.
- When a C-120 tape is wrinkled or unevenly wound at its beginning, an error of about 1 minute may occur in the tape remaining time.



[Fig. 22], [Abb. 22]

TAPE SELECTOR POSITION	BRAND NAME	MODEL NAME
METAL	AMPEX	MPT (METAL PARTICLE TAPE)
	BASF	METAL IV
	FUJI	METAL FR METAL
	maxell	MX
	MEMOREX	METAL IV
	Scotch	METAFINE
	SONY	METALLIC
	TDK	IMA, MA-R
	PHILIPS	METAL
	CrO <sub>2</sub>	AMPEX
AGFA		CrII-S
BASF		Chromdioxid Super II Professional II Chromdioxid II
FUJI		FR-II
maxell		XLII, XLII-S
MEMOREX		HIGH BIAS II
Scotch		MASTER II
SONY		EHF, UCX, UCX-S, CD- $\alpha$ [SA, SA-X]
TDK		Ultra-Chrom
PHILIPS		Ultra-Chrom
NORMAL	AMPEX	GMI (Grand Master I), EDR, ELN
	AGFA	Super-Ferro, Ferro-Color, LNS
	BASF	Professional I, Professional I Super Performance, LH super I, LH extra I
	FUJI	EL, FR-I, ER, DR
	maxell	XLI, XLI-S, UD, UL, LN
	MEMOREX	MRX-I
	Scotch	MASTER I, Dynarange, Highlander
	SONY	LNX (CHF), HFX (BHF), SHF (AHF)
	TDK	[D], OD, AD
	PHILIPS	Ferro, Ultra-Ferro

- tapes are recommended to achieve the best results with the Dolby C-type NR system. The AD-F860Z model is equipped with a CrO<sub>2</sub>/Co SELECTOR switch. Set the SELECTOR switch in the CrO<sub>2</sub> position when using CrO<sub>2</sub> tapes (□), and in the Co position when using cobalt tapes.
- Bänder erbringen die besten Leistungen mit dem Dolby C-Rauschunterdrückungssystem. Modell AD-F860Z ist mit einem CrO<sub>2</sub>/Co-Wahlschalter (CrO<sub>2</sub>/Co SELECTOR) ausgestattet. Den Wahlschalter bei der Verwendung von CrO<sub>2</sub>-Bändern (□) auf CrO<sub>2</sub> und für Kobaltbänder auf Co stellen.
- Les bandes □ sont recommandées pour obtenir les meilleurs résultats avec le système Dolby NR type C. Le modèle AD-F860Z est équipé d'un commutateur sélecteur CrO<sub>2</sub>/Co (CrO<sub>2</sub>/Co SELECTOR). Réglez ce sélecteur sur la position CrO<sub>2</sub> lors de l'utilisation de bandes CrO<sub>2</sub> (□), et sur la position Co lors de l'utilisation de bandes au cobalt.
- Las cintas □ son recomendadas para obtener los mejores resultados con el sistema Dolby NR tipo C. El modelo AD-F860Z está equipado con un interruptor selector de CrO<sub>2</sub>/Co (CrO<sub>2</sub>/Co SELECTOR). Ajuste el interruptor selector en la posición CrO<sub>2</sub> cuando use cintas de CrO<sub>2</sub> (□) y en la posición Co cuando use cintas de cobalto.
- si consiglia l'impiego dei nastri con il sistema Dolby NR, tipo C, per ottenere migliori risultati. Il modello AD-F860Z è provvisto di un selector CrO<sub>2</sub>/Co (CrO<sub>2</sub>/Co SELECTOR). Porre il selettore alla posizione CrO<sub>2</sub> per l'impiego di nastri CrO<sub>2</sub> (□) e alla posizione Co per l'impiego di nastri al cobalto.

## METAL TAPES [Fig. 22, 23]

Metal tapes employ pure iron for the magnetic material and they display a remanence which is about twice as high as that of ordinary tapes which use metal oxides. This feature results in the following three improvements:

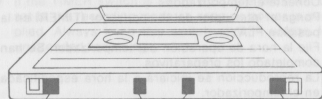
- (1) Superior characteristics are exhibited in the high range frequencies and maximum output level is improved across the whole frequency spectrum.
- (2) Dynamic range is greatly improved.
- (3) Signal-to-noise ratio is also enhanced.

These merits make metal tapes ideal for recording and playing back dynamic music program material.

### Note

An Auto Tape Selector function is built in this deck. The auto tape selector will automatically detect the type of tape used. However, some metal tape cassettes are not provided with holes to trigger tape type detection. In such cases it is advised that you do not use these tapes as you will not achieve optimum setting of equalization and tape bias.

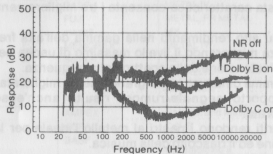
[Fig. 23], [Abb. 23]



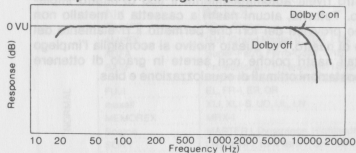
Holes to trigger Metal tape type detection  
 Öffnungen für die Bandtyp-Erfassung  
 Troux pour déclencher la détection du type de bande  
 Orificios para disparar la detección del tipo de cinta  
 Fori che permettono il rivelamento del tipo di nastro

CrO<sub>2</sub> tape detection slot  
 CrO<sub>2</sub>-Bänderkennungsöffnung  
 Encoche de détection de bande CrO<sub>2</sub>  
 Ranura de detección de cinta de CrO<sub>2</sub>  
 Apertura per il rivelamento di nastri CrO<sub>2</sub>

### Noise Reduction Effects by Dolby C, Dolby B and NR off



### MOL Improvement in High Frequencies



## DOLBY B · C NR SYSTEM [Fig. 24]

The purpose of any noise reduction is to reduce the amount of residual tape "hiss" present in the playback signal. At the same time, it is important for a noise reduction system to function with minimal coloration to the original sounds.

For many years the well-known Dolby "B" system has been widely employed on cassette decks, and many commercially pre-recorded cassettes also feature the familiar "□" Dolby NR mark on their labels.

The AD-F660 is also equipped with a new, improved Dolby NR circuit, known as Dolby "C". This new system offers several advantages over the previous system, which are briefly outlined below:

1. Maximum noise reduction of approx. 10 dB in "B" system is increased to approximately 20 dB with "C" system.
2. "C" system functions over a wider frequency range, thus extending noise reduction to midrange as well.
3. Tape MOL (Maximum Output Level) is raised, enabling signals to be recorded at higher levels without incurring distortion.
4. Careful input/output level matching provides high degree of signal fidelity.
5. Tapes recorded with Dolby "C" can still be played back on portables or units not having a noise reduction circuit.

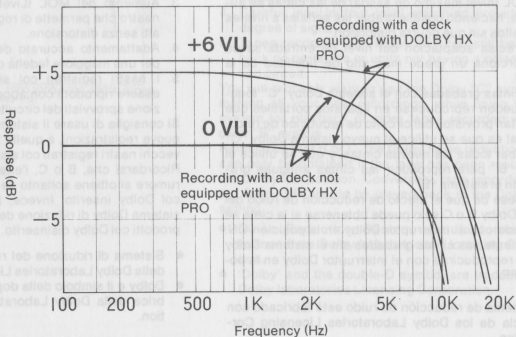
You will probably want to use the Dolby "C" system for making all your new recordings, while using the "B" system for playback of older tapes recorded with the older "B" system.

Remember that B or C, the Dolby noise reduction effect can only be obtained if the tape has been recorded in the Dolby ON position. Conversely, tape recorded without Dolby NR should be played back in the Dolby OFF setting.

- Noise Reduction System manufactured under license from Dolby Laboratories Licensing Corporation.
- 'Dolby' and the double-D symbol are trademarks of Dolby laboratories Licensing Corporation.

## Effect of DOLBY HX PRO when using a Normal position tape

(When a 15 kHz, -10 dB signal is recorded and reproduced simultaneously)



## Active servo bias DOLBY HX PRO

When a source containing high-frequency components is recorded, these components function as a bias and the high-frequency characteristics deteriorate. DOLBY HX PRO is a servo control system which keeps the value of bias always constant by calculating the recording signal and the recording bias current as a whole. A metal-tape-like performance is attained even with LH tapes, because the frequency response is kept flat at all times by stabilizing the dynamic frequency characteristics. Furthermore, the DOLBY HX PRO substantially expands the high-frequency dynamic range.

- This is not a noise reduction system.
- The system functions automatically when the deck is in the recording mode. The dynamic sound recorded with this deck can be played back normally in other decks and headphone stereo sets.

## SERVO BIAS ATTIVO DOLBY HX PRO

Durante la registrazione di una sorgente caratterizzata con picchi di alta frequenza, l'alta frequenza causata deviazioni con conseguente deterioramento della riproduzione. Il DOLBY HX PRO è un sistema servobias attivo che mantiene il livello bias a un valore costante calcolando il segnale in registratore e il contenuto deviazione in registrazione. Nell'assenza di deviazioni, questo livello viene mantenuto costante. Il sistema automaticamente tramite una stabilizzazione della corrente di bias della frequenza dinamica. Inoltre, il sistema DOLBY HX PRO espande convenientemente la gamma dinamica della sua riproduzione.

Questo non è un sistema di riduzione del rumore. Il sistema è automaticamente in funzione quando il registratore è in funzione. Il suono dinamico registrato è più ampio e la riproduzione è più realistica e più brillante. Questo sistema è disponibile in tutti i registratori a cassette con Dolby.

## CUE/REVIEW

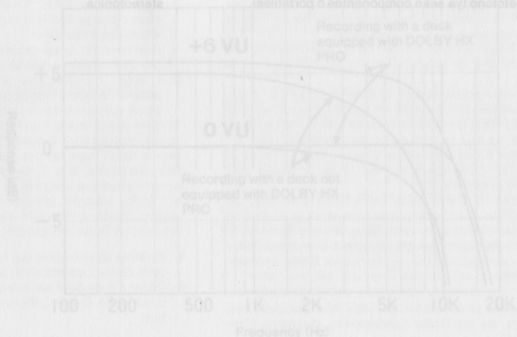
### Review

During recording, you can rewind the tape to the start of the recording or any desired position merely by pressing in and holding the REW/REVIEW button and PLAY button simultaneously. There is no need to push the STOP button when doing this operation. (Review may also be performed from the play mode.)

### Cue

During playback, press the F. FWD/CUE button and PLAY button simultaneously to skip over undesired material on the tape. Location of blank spaces between recorded segments may be easily detected by monitoring the high-pitched noise audible during cue/review operation.

- Both buttons must be held in during CUE or REVIEW operation. To continue in the play mode following operation, be sure to release the F.FWD/CUE or REW/REVIEW button before releasing PLAY. Releasing PLAY first will cause play to be halted.



Quando la registrazione è possibile rinvolvere il nastro all'interno della testina e a qualsiasi posizione desiderata. Per questo scopo premere il pulsante di avanzamento rapido (REW) o di ritorno rapido (FWD) o di ascolto (PLAY). Per questa operazione non è necessario premere il tasto d'arresto (STOP) (il nastro può anche essere effettuato dal modo di riproduzione).

Ripetizione

Quando la riproduzione premere semplicemente il tasto di ascolto (PLAY) o di ritorno rapido (REW) o di avanzamento rapido (FWD) per saltare la parte non desiderata del nastro. Gli spazi vuoti tra i brani registrati possono essere trovati facilmente ascoltando il suono solo che si sente durante l'operazione di riproduzione.

• Esempi: i tasti devono tornare a zero durante le operazioni di ascolto durante l'avanzamento veloce (FWD) o di ascolto (REW).

Per poter continuare in modo ascolto (PLAY) è necessario premere il tasto di ascolto (PLAY) o di avanzamento rapido (FWD) o di ritorno rapido (REW) una di disimpegno il tasto di ascolto (PLAY).

Se il tasto di ascolto (PLAY) venisse disimpegnato, il modo di ascolto verrà cancellato per prima.

ADMS (AUTO DE-MAGNETIZING SYSTEM)

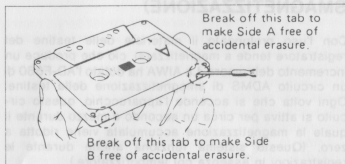
Through long use, the head material on a tape deck tends to build up magnetization and this in turn can lead to an increase in noise. AIWA has provided the AD-F660 with an ADMS circuit to remove this head magnetization. Each time the power is turned on, this circuit activates for approximately 1.5 seconds, during which built up magnetization is effectively reduced to zero. (It also functions during unattended recording with a timer.)

- During the 1.5 seconds of ADMS operation, transport controls will not operate.
- ADMS operation will not affect a recorded tape inserted in the unit.

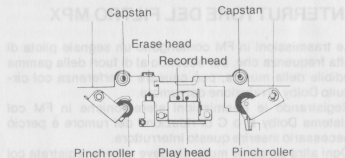
MPX FILTER SWITCH

FM broadcasts contain a high-frequency pilot signal which, while out of the audible range of the music, can cause interference with the Dolby NR circuit. Therefore if using Dolby B or C noise reduction when recording from an FM stereo tuner, this switch should be turned on. All other music sources should be recorded with the MPX filter in the OFF position.

[Fig. 25], [Abb. 25]



[Fig. 26], [Abb. 26]



## PREVENTING ACCIDENTAL ERASURE

All cassettes feature a safety device to prevent accidental erasure. To assure that a favorite tape is protected from being erased, use a screwdriver or pointed tool to break off the plastic tabs at the corners of the cassette, as shown in the illustration. Once the tabs are removed, the RECORD button cannot be set, thus preventing the tape from being erased. [Fig. 25]

### Re-use:

Recording on a cassette from which the tabs have been removed can be done by covering the tab openings with a piece of cellophane or electrical tape.

- \* Take care not to cover the CrO<sub>2</sub> tape detection slot when covering the tab openings.

## ERASING TAPE

If a tape recorded program is no longer required, a new recording can be made onto the same tape. The earlier program becomes erased and replaced by the new program.

To completely erase a tape, set the RECORD LEVEL controls to 0 and perform recording. This will completely erase the tape.

## CLEANING [Fig. 26]

During use, the heads, capstan and pinch roller of the unit pick up small particles and dust from the tape. If these particles are permitted to accumulate, they can have a detrimental effect on both recording and playback performance. It is therefore recommended that the parts be kept clean at all times.

A cotton-tipped stick moistened in good-quality alcohol or commercially-available head cleaning fluid is best for this purpose. Generally, the heads and pinch roller should be cleaned at least once for every 50 hours use, or twice a month.

## SPECIFICATIONS

Type	Stereo cassette deck	
Track format	4 tracks 2 channels	
Circuitry	17 ICs, 78 transistors, 29 diodes, 46 LEDs	
Power supply	AD-F660E, Z	AC 220V 50 Hz
	AD-F660K, G	AC 240V 50 Hz
	AD-F660U, C	AC 120V 60 Hz
	AD-F660H	AC 120V/220V/240V
		switchable, 50/60 Hz
Power consumption	26 W	
Frequency response	METAL tape:	20—20,000 Hz
	CrO <sub>2</sub> position tape:	20—19,000 Hz
	LH tape:	20—18,000 Hz
Signal-to-noise ratio	75 dB (METAL tape DOLBY C NR ON)	
Wow and flutter	According to DIN 45 500	0.09%
	0.028% (WRMS)	
Tape speed	4.8 cm/sec. (1-7/8 ips)	
Rewind time	70 sec. (C-60)	
Fast forward time	70 sec. (C-60)	
Recording system	AC bias (frequency 85 kHz)	
Erase system	AC erase	
Motor	DC Servomotor for capstan	
	DC motor for reels	
Head	Recording, playback head, DX combination head	
Inputs	MIC maximum input sensitivity: 0.3 mV	
	(200 ohms—10 k-ohms matched)	
	LINE IN maximum input sensitivity: 50 mV (over 50 k-ohms)	
Outputs	LINE OUT standard output level: 0.41 V (0 VU);	
	Suitable load impedance: over 50 k-ohms;	
	Headphones: 8 ohms	
Dimensions	420(W) × 110(H) × 280(D) mm	
Weight	5.5 kg	
Accessories	Stereo pin cord..... 2	

- Specifications and external appearance are subject to change without notice due to product improvement.

\* HX PROFESSIONAL ORIGINATED BY BANG & OLDFSEN

## SPECIFICHE

### Explanation of Graphical Symbols:

Sistema di pila  
Semi-conduttori  
Potenza richiesta

4 pile, 3 canali  
17% T.D. 75 transistori  
AD-F560L 2  
C.A. 220V 50Hz  
AD-F560K 0  
C.A. 240V 50Hz  
AD-F560L 0



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

### Consumo d'energia

### Risposta di frequenza

AD-F56011  
C.A. 120V/220V/240V  
omnipolare 50/60Hz  
25 W  
Nastro metale: 20-20.000 Hz  
Nastro CrO<sub>2</sub>: 20-19.000 Hz  
Nastro LH: 20-15.000 Hz

### Rapporto segnale- a-rumore

### Wow e flutter

75 dB (Nastro metale) DOLBY C NR attivato  
Secomp DIN 45 507: 0,03%

### Velocità del nastro

### Tempo di avvolgimento

### Tempo di srotolamento, rapido

### Sistema di registrazione

### Sistema di cancellazione

### Motore

### Testine

4,5 cm/sec  
70 sec (C-60)  
70 sec (C-60)  
Polarizzazione C.A. (frequenza 55 kHz)  
Cancellazione C.A.  
Servomotore C.C. per trasporto  
Nastro in C.C. per antiscia  
Testine di registrazione, riproduzione combinate  
3X

### Entrata

### Uscite

Maxima sensibilità  
200 ohm-10 k-ohm  
Maxima sensibilità  
50 k-ohm  
Livello di uscita stereo  
VU  
Impedenza di carico: più di 500 ohm  
Cuffie: 8 ohm  
450 lunghezza x 110 larghezza x 85 spessore

### Download

### Accessori

Cavi e spine stereo

• Caratteristiche e forma esterna possono cambiare senza preavviso a discrezione della S di exportare continue importe.

• UN PROFESSIONAL DESIGNED BY BANG & OLUFSEN

## IMPORTANT

(K model only)

The wires in this mains lead are coloured in accordance with the following code:

Blue: Neutral  
Brown: Live

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows.

The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black.

The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.

# AIWA Co., Ltd.

<input type="checkbox"/> AGFA-Ferro color	<input type="checkbox"/> AGFA-LNS, Super-Ferro	<input checked="" type="checkbox"/> AMPEX-Grand Master II	<input type="checkbox"/> FUJI-FR I	<input checked="" type="checkbox"/> BASF-professional-II	<input type="checkbox"/> SONY-SHF, AHF
<input type="checkbox"/> BASF-performance	<input type="checkbox"/> AMPEX-Grand Master I	<input checked="" type="checkbox"/> BASF-chromdioxide II	<input type="checkbox"/> maxell-UD, XLI-S	<input checked="" type="checkbox"/> maxell-XL II, XL II-S	<input type="checkbox"/> TDK-AD, AD-X
<input type="checkbox"/> maxell-UL	<input type="checkbox"/> TDK-D	<input checked="" type="checkbox"/> FUJI-FR II	<input type="checkbox"/> TDK-OD	<input checked="" type="checkbox"/> SONY-UCX-S	<input checked="" type="checkbox"/> BASF-chromdioxide super-II
<input type="checkbox"/> PHILIPS-Ferro	<input type="checkbox"/> FUJI-DR, ER	<input checked="" type="checkbox"/> Scotch-MASTER-II	<input type="checkbox"/> Scotch-DYNARANGE, MASTER-I	<input type="checkbox"/> NORMAL	<input checked="" type="checkbox"/> CrO <sub>2</sub> BIAS FINE (%)
<input type="checkbox"/> SONY-LNX, CHF	<input type="checkbox"/> maxell-XLI	<input checked="" type="checkbox"/> SONY-EHF, CD- $\alpha$ , UCX			
<input checked="" type="checkbox"/> MEMOREX-HIGH BIAS II	<input type="checkbox"/> HFX, BHF	<input checked="" type="checkbox"/> TDK-SA, SA-X			
<input type="checkbox"/> MEMOREX-MRX I	<input type="checkbox"/> SONY-				

