TANDBERG® TCD 910/911

Operating Instructions

				PEAK READING METERS					

Left   **PEAK READING METERS**   Right

20 12 6 3 ∞ 0   3   6 dB   20 12 6 3 ∞ 0   3   6 dB

M   M

Recap   Space

RELEASE   **<<**   **>>**   **PLAY**   **STOP**   **RECORD**

Cal/Set   Cue Points   Search   Cut   Input Level

No   Cut No   Stop   -3   +3
Off   Off   Off   -6   +6
GTO   Cueing   BOT   -15   +12dB
   -30

Monitor/Test   Phones Vol   Dolby NR   Balance

Source
TAPE
Off
15kHz
315Hz

Off
B
C

Min.   Max.

For your safety!

To prevent electrical shock or fire, do not expose electronic products to rain or moisture and do not remove covers (or back). If anything fails, leave the repairs to a qualified technician.

Pull out the power plug during thunderstorms and when you are away for a long time (e.g. holidays, etc.).

The introduction of the Tandberg series TCD 900 shatters the barrier of Professional Cassette use. For the first time combined in one machine are superior sound capability, superior mechanical and electronic design, and total control flexibility based on a 8-bit microprocessor with 32 K of EPROM memory.

Also included in this series is the experience of 50 years of electronic and tape recorder design/manufacturing. In fact, for over half a century the Tandberg reputation for quality, outstanding performance and long term owner loyalty has been based on our commitment to total excellence in product, from sub chassis to external appearance.

TCD 910 Master Cassette Recorder

TCD 910 is designed to replace in many use both reel to reel and cartridge machines. This recorder is capable of producing tapes at sound and silence levels beyond that required by broadcasting and studio standards. Combined with its extremely accurate real time counter and built in autolocator functions, this machine is truly a multi-purpose cassette recorder.
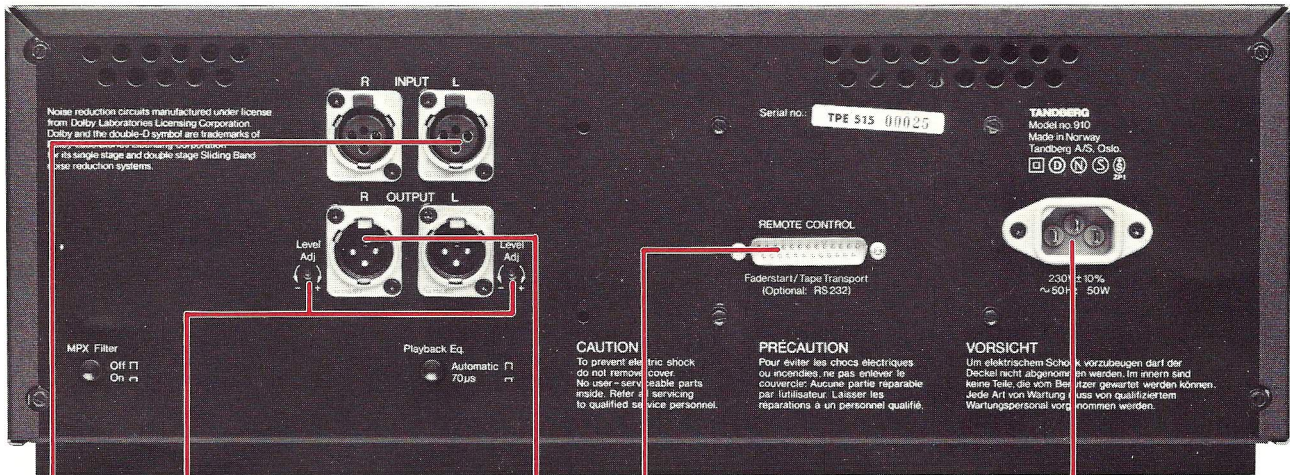
TCD 911 Playback Cassette Deck

An economical alternative to inferior home tape decks in professional settings. TCD 911 offers the same quality of construction and design as TCD 910.

Contents

Connections

Noise reduction circuits manufactured under license from Dolby Laboratories Licensing Corporation. Dolby and the double-D symbol are trademarks of [...] single stage and double stage Sliding Band noise reduction systems.

R INPUT L

R OUTPUT L

Level Adj   Level Adj

MPX Filter Off / On

Playback Eq. Automatic / 70µs

Serial no.: TPE 515 00025

Model no. 910
Made in Norway
Tandberg A/S, Oslo.

REMOTE CONTROL
Faderstart / Tape Transport
(Optional: RS 232)

230 V ± 10%
~ 50 Hz   50 W

Output Level adjustments

Rel. 250 nWb/m
+ 6 dBu (Europe)
+ 8 dBu (USA)
adjustable from
− 2 to + 12 dBu

Inputs

Return (−)
Live (+)

Outputs

Live (+)
Return (−)
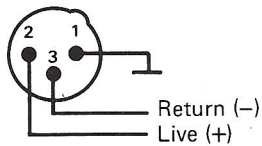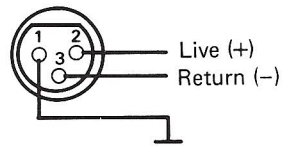
XLR Male
Part No. 424647

Electronically balanced input
Impedance > 40 kohms
up to 100 kHz

XLR Female
Part No. 424650

Electronically balanced output
Impedance < 30 ohms
load impedance > 300 ohms
10 Hz to 100 kHz

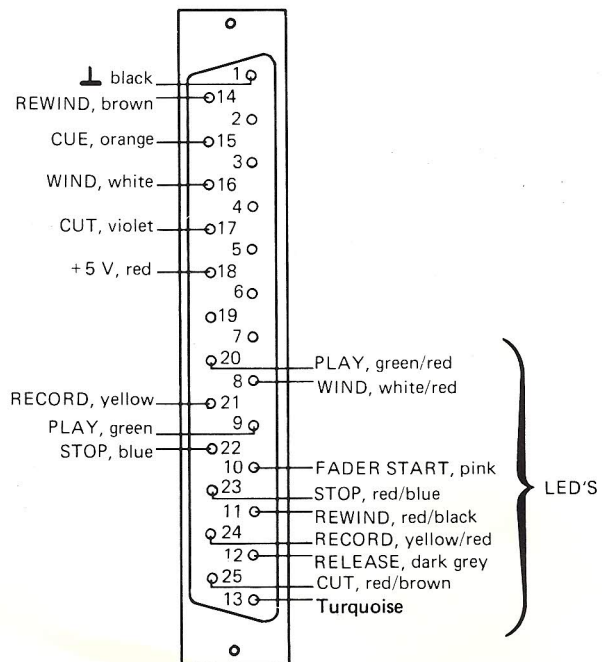## Mains connection

Power requirements

Make sure the cassette deck is marked at the back with the correct voltage and frequency for your area, 230 V ± 10%, 50 Hz or 115 V ± 10%, 60 Hz.
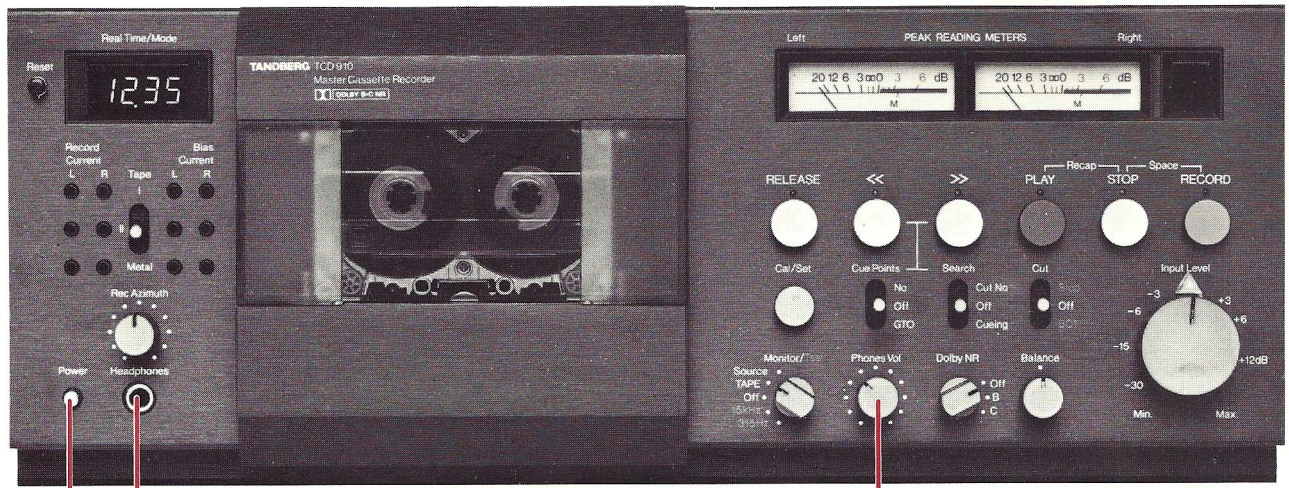
Changing the voltage and/or frequency should be carried out by a competent service engineer.

The power consumption is 50 watts.

Remote Control

The actual function is activated by connecting to ground.

⊥ black — 1
REWIND, brown — 14
 — 2
CUE, orange — 15
 — 3
WIND, white — 16
 — 4
CUT, violet — 17
 — 5
+ 5 V, red — 18
 — 6
 — 19
 — 7
 — 20 — PLAY, green/red
 — 8 — WIND, white/red
RECORD, yellow — 21
PLAY, green — 9
STOP, blue — 22
 — 10 — FADER START, pink
 — 23 — STOP, red/blue
 — 11 — REWIND, red/black
 — 24 — RECORD, yellow/red
 — 12 — RELEASE, dark grey
 — 25 — CUT, red/brown
 — 13 — Turquoise

LED'S

Mains switch

When the deck is connected to the mains and the mains switch is pressed in the deck is ready for operation after about 5 seconds and will not take any commands before the counter display has changed from — — — — to C-60.

Headphones Volume

Headphones

| Connection: | ¼'' stereo jack plug. |
| Impedance: | 8 ohms minimum. |

The headphones volume is controlled by means of the Phones Vol. button.


HEADPHONES

Ground
Left channel
Right channel

Loading the cassette into the deck

— Hold the cassette with the tape edge down. The normal direction of tape movement is from left to right.

— Load the cassette into the tape path as shown in the figure.

When removing the cassette the deck must be set to release.

After fast winding when the tape stops at the end the deck automatically goes to release position.

NOTE! When the deck is switched off and not in the release position the cassette mechanism is locked. Therefore, always press the RELEASE button before the deck is switched off.
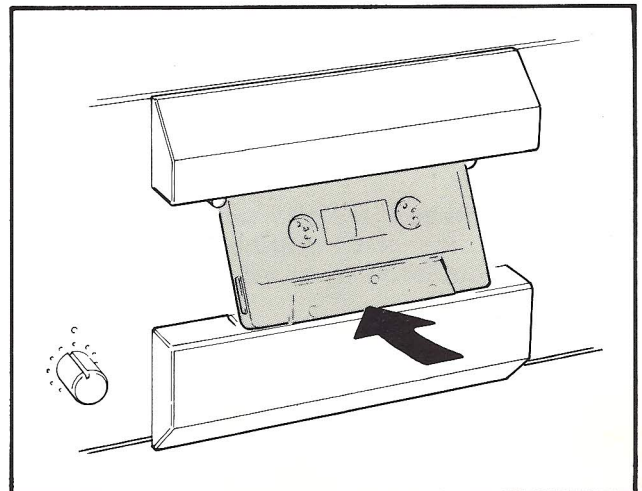
Main operating controls on TCD 910

RELEASE

Press to release cassette.

<<

REWIND. A short press on this button rewinds the tape.
Hold the button in to rewind at half speed.

>>

WIND. A short press on this button winds the tape forwards.
Hold the button in to wind at half speed.

PLAY

Press to enter play mode from any other main mode (release, wind, rewind, stop, record).

Recap

The passage on the tape you are listening to can be repeated with the recap function. Hold PLAY and STOP in simultaneously. The tape will rewind slowly and go over to play when you release the buttons.

STOP

Press to stop the tape.

The heads will be in the play/record position which gives the shortest possible time delay when the deck is put into play or record mode.

If the WIND and REWIND buttons are pressed simultaneously and released with a time delay less than 0.3 second, the deck will also go into the stop mode, but with the head bridge in another position. From this stop position to play will take longer than when the STOP button is used.

RECORD

When the light diode over the RECORD button blinks the deck can enter the record mode. (If the record prevention tab on the cassette has been removed, the diode will not blink).

There are several methods to set the deck into the record mode:

To record from stop
— Hold RECORD button in and give PLAY button a short press (Alternatively press both buttons in and release RECORD button last).

To record from play (Flying Start)
— Hold PLAY button in. When recording is due to start, press RECORD and hold in. Then release PLAY (first) and RECORD (second).

Space during recording
— Hold RECORD button in and give STOP button a short press (< 1.5 second), then release RECORD. The deck will automatically record a pause of 4 seconds and go into the stop mode.

— A recording pause of any length over 2 seconds can also be obtained. Simultaneously hold in RECORD and STOP. Release STOP and the deck will go over to record mode. Alternatively release RECORD and the deck will go to stop.

— At the start of a recording a pause can be recorded. Hold STOP and RECORD in and give PLAY a short press. The pause will last as long as STOP and RECORD are held in. If STOP is released first, the deck will continue in the record mode.

Main operating controls on TCD 911
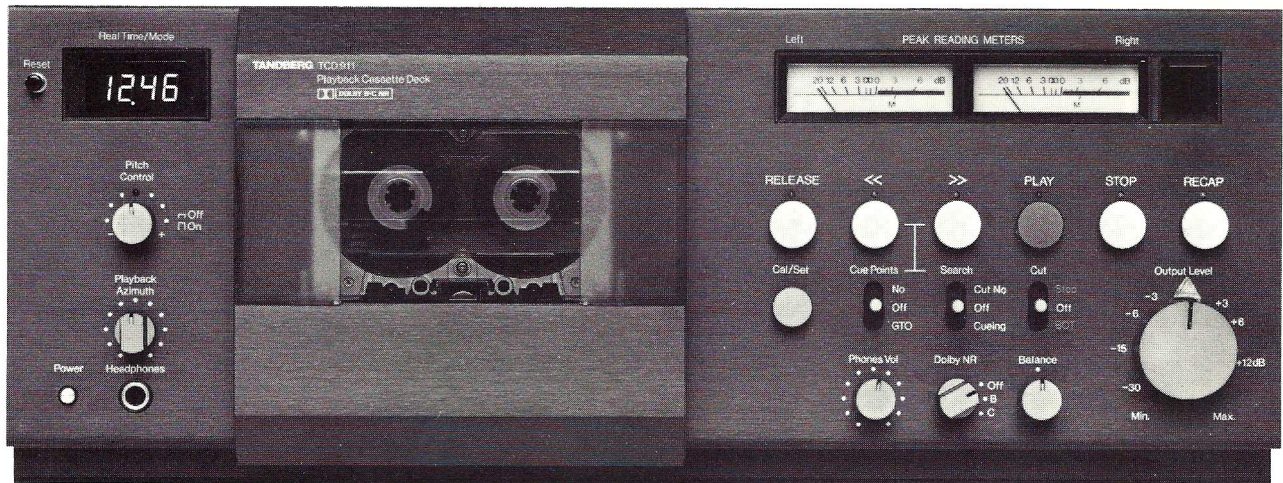
RELEASE

Press to release cassette.

<<

REWIND. A short press on this button rewinds
the tape.
Hold the button in to rewind at half speed.

>>

WIND. A short press on this button winds the
tape forwards.
Hold the button in to wind at half speed.

PLAY

Press to enter play mode from any other mode
(release, wind, rewind, stop).

STOP

Press to stop the tape.

The heads will be in the play/record position
which gives the shortest possible time delay when
the deck is put into play or record mode.

If the WIND and REWIND buttons are pressed
simultaneously and released with a time delay less
than 0.3 second, the deck will also go into the
stop mode, but with the head bridge in another
position. From this stop position to play will
take longer than when the STOP button is used.

RECAP

The passage on the tape you are listening to can
be repeated with the recap function.

Hold the RECAP button in and the tape will
rewind slowly with sound from the tape. When
the button is released the deck will go over to
play.

Tape counter

The deck has a primary counter and a secondary counter. At switch on, the secondary counter operates and shows C-60 in the counter display.

When the deck is put into any main mode the secondary counter will show in the display. Press the Reset button to reset the secondary counter.

During rewind past zero the counter will show negative numbers. If the tape is wound back past − 9.59 the left cipher changes from a minus sign to a number.

To obtain the primary counter, hold the STOP button in and press the Cal/Set button. The primary counter mode is indicated by a blinking point at the right cipher.

If the Cal/Set button is held in longer than 2 seconds the deck will go into the calibration routine. While the deck is being calibrated for tape thickness, CAL shows in the display.

After calibration the deck goes to release and the display shows the tape length C-60, C-60L, C-90 or C-90L. This facility can also be selected manually — just press Cal/Set.

The counter is now calibrated to show the correct running time for the respective tape. After calibration both primary and secondary counters are correctly set. Furthermore the primary counter will always zero itself to the start of the tape on rewind.

Programming addresses

An address is a programmed stopping point with a display on the primary counter as reference. Up to 10 stopping points can be stored in the deck's memory (11 stopping points when the STOP button is pressed).

Before programming begins, the primary counter must be set to zero at the start of the tape.

NOTE! At switch off all programmed addresses are lost.

There is no sound from the tape during program searching in the Cueing mode.

Programming in play or record mode
Play and record have automatic incrementation with programming of new addresses.

With the Cue Points switch in the No position the display will show the last stored address. Now if the Cal/Set button is pressed the new address will be stored at the address the display moves to.

Programming of addresses can also be carried out in wind and rewind modes with or without cueing. The method is the same as for play and record modes.

Cue Points selector
When the Cue Points selector is set to the No position, the display shows stored address numbers. In this position you can search in the address register by using the WIND and REWIND buttons.

If you press WIND and REWIND simultaneously you will see the counter value on the address number showed on the display.

If you set the Cue Points switch to GTO, the tape will wind to the address shown in the No position of the selector.

Programming in stop mode
The stop mode does not have automatic incrementation during programming of new addresses. The address number can be found when the Cue Points selector is in the No position and the WIND or REWIND button is pressed.

Press the Cal/Set button to store the address number that shows in the display.

The value 00.00 is included in all unused address numbers. If an unused address shows in the display and the Cue Points selector is set to GTO, the tape will wind to 00.00 referred to the primary counter.

Search selector

With the Search selector at Cut No, programs can be located with the aid of recorded pauses of at least 4 seconds between any two programs (see Spaces during recording on page 6). When the required program is located the tape will stop 1 second in front of the program and the deck will go over to stop or play depending on which mode has been programmed.

If the Search selector is set to Cut No, then PC 0 (Program Count) will show in the display. With the aid of the WIND and REWIND buttons the required cut number can now be programmed. With the WIND button, up to 9 programs can be programmed forwards and the REWIND button allows 9 programs to be programmed backwards.

When the Search selector is set to Off, the search for the required program starts. When the program is located the deck will go over to stop If you want the deck to go directly over to play at the end of the search, you must press the PLAY button before you set the Search selector to Off. The display will then show PP (Program Play) instead of PC.

To cancel the programs you must press STOP. The display will then show PC 0 and nothing will happen when the Search selector is set to Off (emergency exit).

Cueing

When the Search selector is at Cueing you will obtain sound from tape during winding at the same time as the winding speed is reduced to ¼ of full speed.

Cut selector

The Cut selector is used to stop or rewind the tape back to the beginning.

When the Cut selector is set to stop the light diode over STOP blinks when PLAY is pressed. When the deck finds a pause longer than 4 seconds it goes to stop mode. If the pause is up to approx. 30 seconds the deck will mute the playback after the first 4 seconds, wind the tape forwards to the next program and go over to stop approx. 1 second in front of that program. If the pause is longer, the deck will only go to stop after 30 seconds.

In the record mode the deck will wait approx. 20 seconds for a new program before it goes over to stop.

When the Cut selector is in the BOT (Beginning Of Tape) position and the PLAY button is pressed the light diode over REWIND blinks. When the deck finds a pause of at least 4 seconds it will wind the tape back to the beginning and go over to release. This facility is not available in the record mode.

Playback
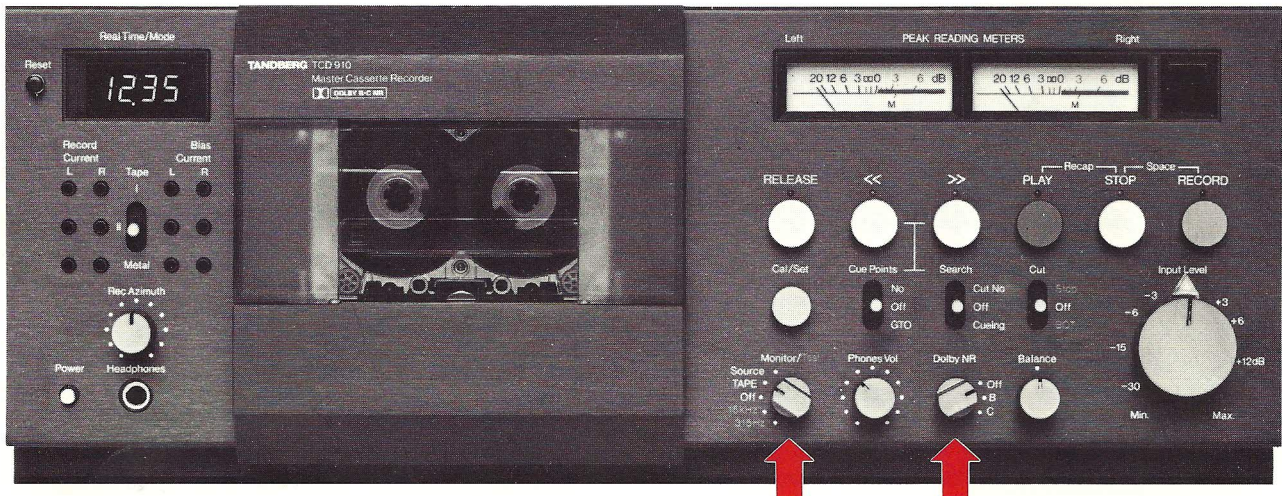
TCD 910/TCD 911 is fitted with automatic selection of correct playback equalization which operates for all standard cassettes.

When older non-standard types of cassettes are used in groups II and III (70 μs) the playback equalization must be selected manually at the back of the deck (Playback Eq. button). These cassettes do not have an opening at the side of the record protection tab. See section on Record Protection Device, page 16.


Dolby NR* selector

— If the tape is recorded with the Dolby B or C NR system, set the selector to the correct Dolby NR (B or C) position.

The new Dolby NR system Dolby C gives a better signal-to-noise ratio and the tape allows higher levels (stronger signals) to be recorded. This makes it possible to achieve a flat frequency response with Metal tape when the tape is recorded to the M mark on the PEAK READING METERS.

— Load the cassette into the deck.

— Set Monitor/Test selector to TAPE position.

— Press the PLAY button.

* "Dolby" and the double-D-symbol are trademarks of Dolby Laboratories Licensing Corporation.
Noise reduction system manufactured under license from Dolby Laboratories Licensing Corporation.
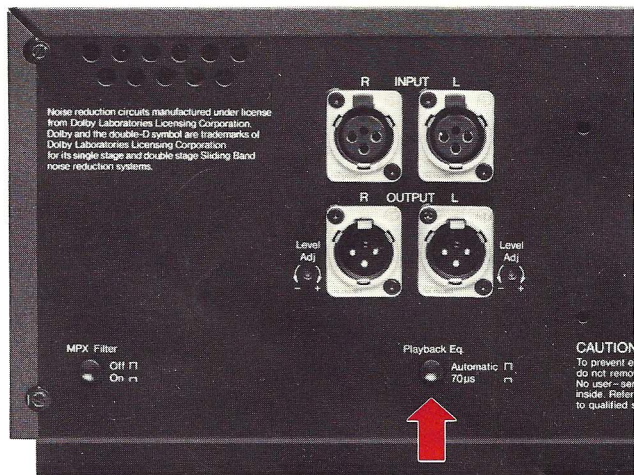
Playback, TCD 911 only
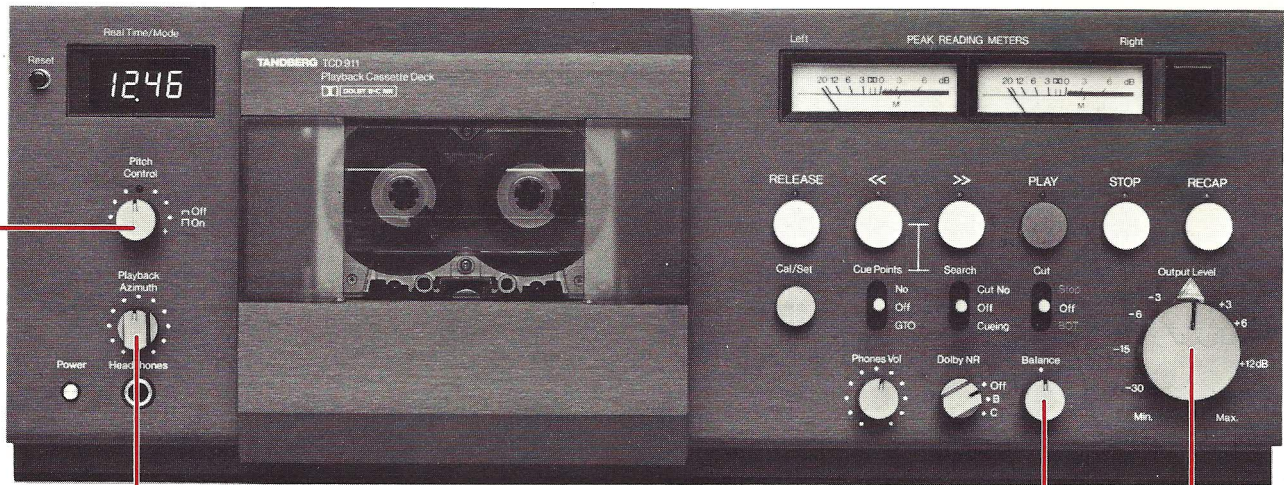
Playback azimuth adjustment

Occasionally the azimuth setting might be different from cassette to cassette. Adjust the playback azimuth to maximum treble out by listening to the program on the cassette.

Pitch Control

When the Pitch Control is pulled out the speed can be adjusted to ± 6% in playback.

RECAP

See chapter of Main Functions, page 7.

All other functions (except for the Monitor/Test selector and the Space function) are similar with the TCD 910 as mentioned in the Playback section on page 10.

Balance and Output Level with detent.

Choose the right type of cassette

Use the best quality cassettes. If you need advice on the choice of cassettes, consult your Tandberg professional dealer.

If the recording is to be made from an FM receiver without a 19 kHz MPX filter, the MPX filter in the deck must be used. The filter switch is at the back of the deck.
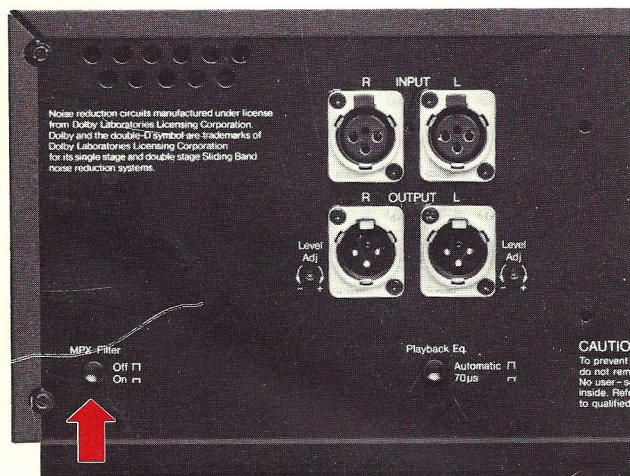
The Tape selector (located under the counter) provides the correct bias and equalization for recording. At the factory the TCD 910 is adjusted for these cassette types:

Group I: Maxell XL I S
Group II: Maxell XL II S
Metal: Maxell MX Metaxial

Cassette coding: Group I

Group II

Group IV, Metal
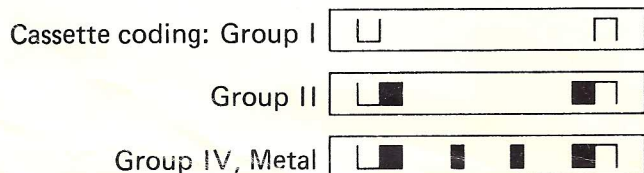
Azimuth adjustment — record head

An azimuth adjustment should **always** be carried out to obtain the best result . . . . .

. . . . . before you start a recording, regardless of whether the cassette is old or new, and regardless of where the recording starts on the tape.

. . . . . when you turn the cassette over to use the other side.

. . . . . when you change to another cassette and continue the recording on the second cassette.

NOTE! In **playback** no azimuth adjustment is necessary on the TCD 910.

— Load a cassette into the deck.

— Press the STOP button and the RECORD LED will start blinking. If not, the cassette is protected against recording. Read the section called Record Protection Device, page 16.

— Set Monitor/Test selector to 15 kHz.

— Press RECORD and PLAY button.

— Adjust the Azimuth control to obtain the highest and most stable deflection on both PEAK READING METERS.

— Rewind the cassette.

— Set the Monitor/Test selector to Source.

Recording

— Connect the program source.

— Set the Dolby NR selector to the position you want, B, C or Off.

— Press the STOP button.

— Adjust the Input Level and Balance control to obtain a deflection of 0 dB on the PEAK READING METERS or to the M mark if you use Metal tape.

— Set the marker to the click-point. You can use the marker to remember your recording level if you want to fade out the program.

— Press in the RECORD and PLAY button and release the PLAY button first.

Pauses during recording

— Hold the RECORD button in while you press the STOP button in. The program is muted while both buttons are held in. See Spaces during recording on page 6.

You can also start the recording with a pause.

— Press the STOP button first, then the RECORD and PLAY button while holding the STOP button.

— Release the STOP button first, then release the PLAY button and the program will be recorded on the tape.

Monitoring a program during recording

Watch the PEAK READING METERS

Correct setting of the input controls is very important! If the controls are set too high the program meters will deflect far into the red zone for long periods, the tape will be over-magnetized and the recording will be distorted.

On the other hand, if the needle does not reach the red zone even in the loudest sound passages, the recorded signal will be too weak. This will reduce the recorded signal-to-noise ratio and the tape noise will be more noticeable.

Always adjust the input controls during the loudest passages in the program you are going to record, to avoid later adjustments.
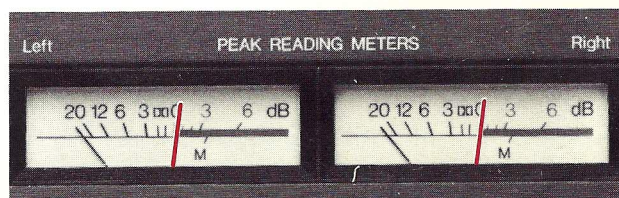
Normal recording level, conventional tape types
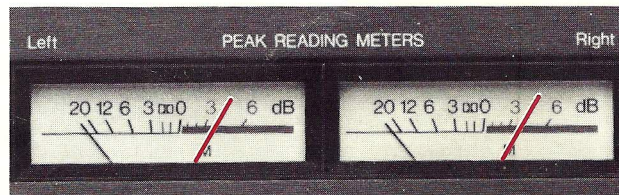
Normal recording level, metal tape

Program Source/Tape monitoring

While recording you can check the recorded quality by means of the Monitor/Test selector.

Listening can be by means of:

— Headphones connected to the TCD 910.

— Headphones or loudspeakers connected to the amplifier.

When the Monitor/Test selector is in the Source position the program is heard *before* it is recorded on tape. This is called the Source test.

When the Monitor/Test selector is in the TAPE position the program is heard a split-second *after* it has been recorded on tape. This is called Tape test.

If the recording is properly carried out, it is very difficult to observe any difference in sound quality between the two tests.

If you hear a significant difference in quality between the two tests it possibly means that the recording is not being carried out properly. A common fault is input controls which are set too high (distortion) or too low (tape noise).

If there is still a difference between the two tests, check the following:

— Is the Rec Azimuth set properly?

— Is the Tape selector set to the correct tape type?

— Is the tape path clean?

— Is the quality of the tape good enough?
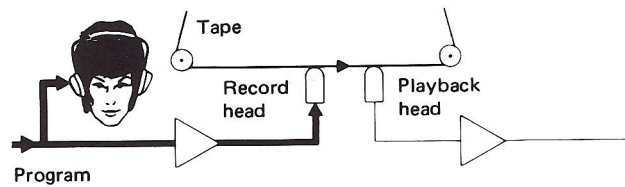
*Source test*
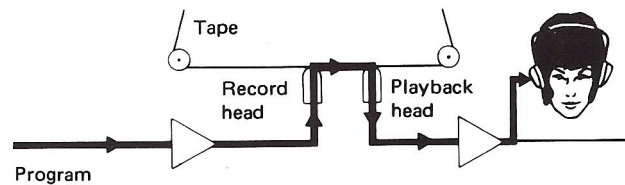
Tape test

Optimizing other types of cassettes

If you want to use cassette types for which the deck is not aligned. The TCD 910 enables you to optimize such recordings to achieve the best possible results regardless of cassette quality.

— Check the tape type in the cassette, group I (normal), group II (Chrome) or Metal (group IV), and set the Tape selector to the appropriate position. The Tape selector also indicates the correct alignment holes, see figure.

— Insert the cassette, turn down the Input Level and set the Monitor/Test selector to 15 kHz.

— Start recording and adjust the Rec Azimuth control to obtain the highest and most stable deflection on both program meters.

— Adjust the Bias Current for both channels to obtain the same deflection for 15 kHz and 315 Hz on the program meters. This is achieved by switching the Monitor/Test selector between 15 kHz and 315 Hz while adjusting. Use the instrument screwdriver provided.

NOTE! If the deflection is higher than 0 dB in the 15 kHz position you must always adjust clockwise to reach 0 dB.

— Set the Monitor/Test selector to 315 Hz and adjust the Record Current to 0 dB on the scale of the program meters.
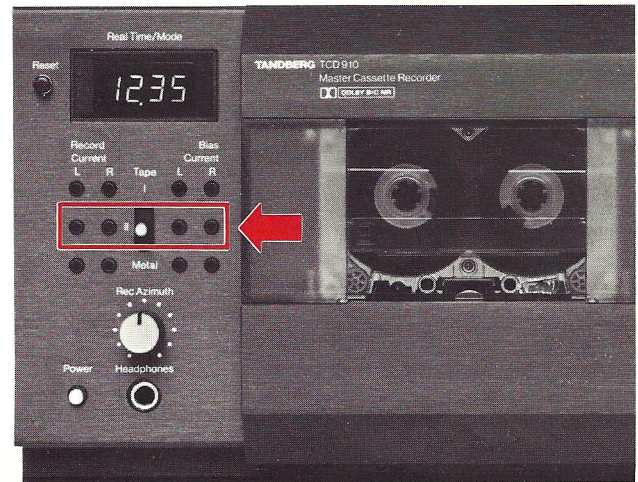
Now both signals, 315 Hz and 15 kHz, should have the same level and give the same deflection on the program meters.

— Turn Monitor/Test selector to Source.

When the Monitor/Test selector is in the 15 kHz or 315 Hz position the Dolby NR system is not in use.

Preadjustment of bias current

If the cassette deck is completely out of adjustment the following procedure should be used:

— Switch Tape selector to the correct position.

— Turn Monitor/Test selector to 15 kHz.

— Set the deck to record.

— Adjust the Rec Azimuth control to obtain the highest possible deflection on both program meters.

— Turn the Bias Current potentiometers fully clockwise. Then turn the potentiometers slowly counter clockwise until you reach 0 dB on the scale of both program meters. If this is not possible, adjust to maximum. Fine adjustments should be carried out as described under "Optimizing other types of cassettes".
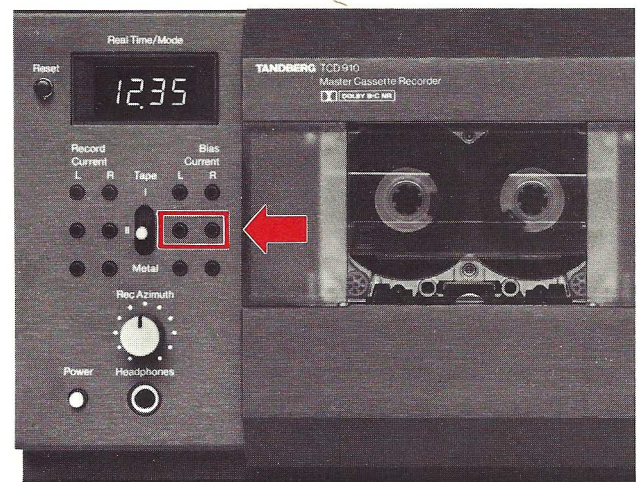
Record protection device

If you have made an important recording it should be protected against accidental erasure by the following method:

On the back edge of a cassette you will see two square holes with a tab covering each hole. Take a small screwdriver or some tweezers and break off the tab that corresponds to the track you have recorded on (see figure). It will now be impossible to record on this track.

Cancel the protection by putting a piece of tape across the hole. Make sure the tape is not wider than the cassette.

NOTE! If the cassette has an extra opening beside the record protection hole, you must **not** tape over this opening. This will prevent the automatic playback equalization from operating, see figure.
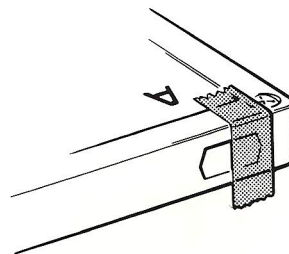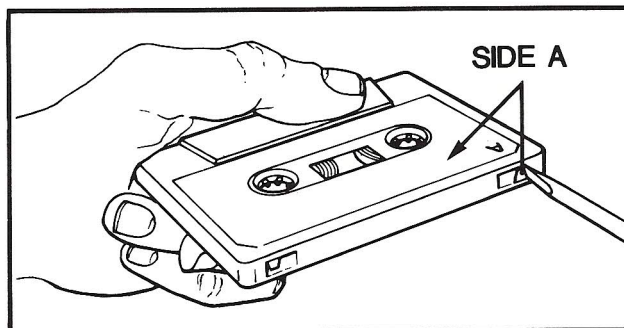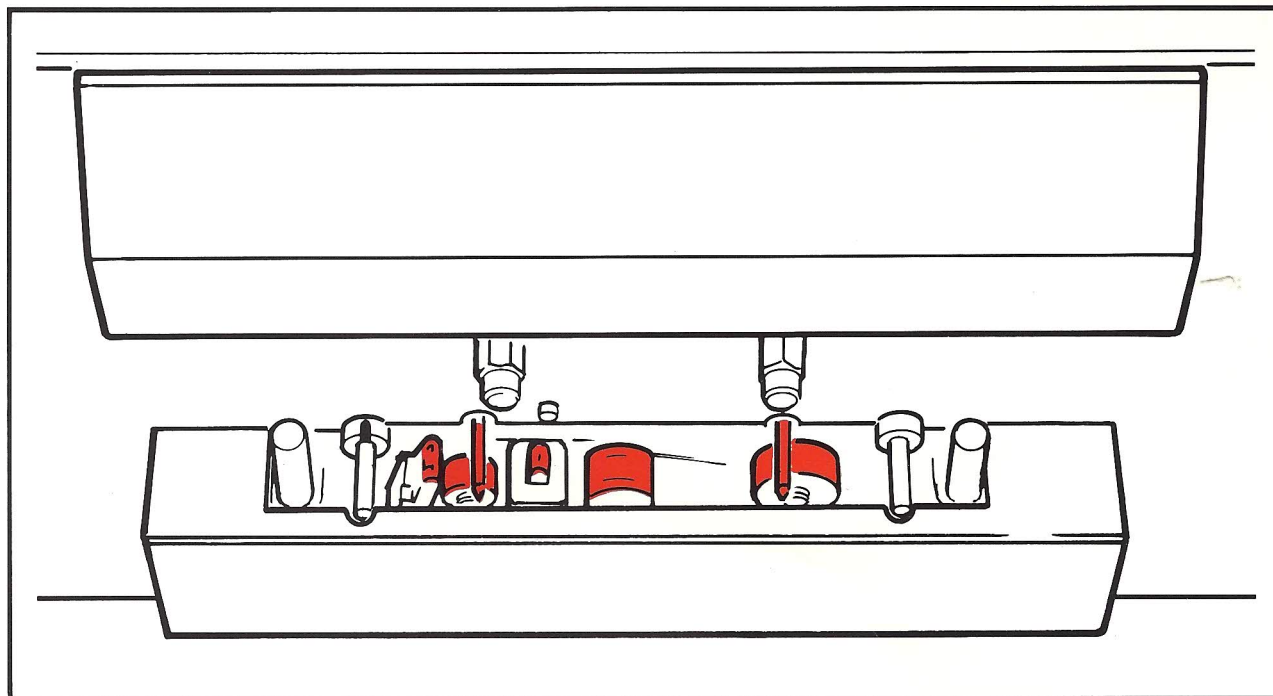

Dust cover

Press the dust cover in position between the two fixed covers, see figure.
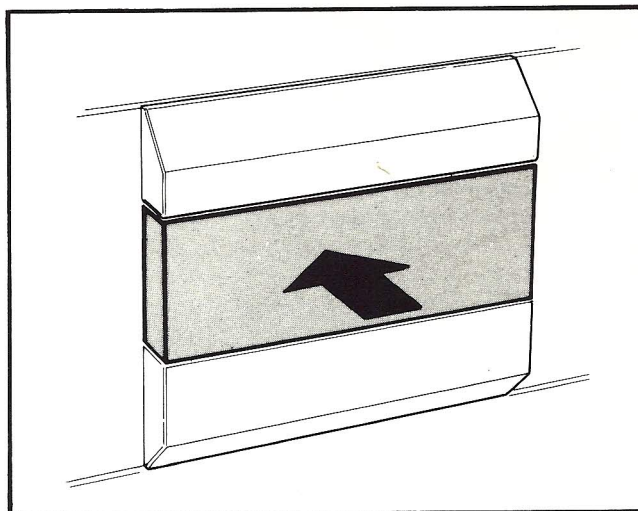
Cleaning the tape path

The parts of the cassette deck which come into contact with the tape should be cleaned at regular intervals, otherwise the sound quality (treble) will be significantly reduced.

How often should the tape path be cleaned?

If the deck is used daily, it should be cleaned *at least* once a month. It pays to clean before an important recording.

If the tape starts to run unevenly, the capstans and pinch rollers should be cleaned straight away.

Which cleaning agent should be used?

Use cotton swabs or a piece of clean flannel wrapped round a wooden stick. Moisten the cotton/flannel with *pure alcohol or methylated spirit.*

IMPORTANT! Do **not** use acetone, carbon tetrachloride, trichloroethylene, or similar strong solvents. They will damage the heads. Do not use sharp or hard objects.

How should you clean?

— Press the RELEASE button and remove the cassette.

— Press the STOP button. This raises the tape path and makes it more accessible for cleaning.

— Clean those places marked in colour in the figure. The pinch rollers must be well dried after cleaning.

NOTE! Take care that the cleaning fluid does not flow into the capstan bearings.

Demagnetizing

An audible increase in background noise from the tape can be a sign that the head and other parts of the tape path need to be de-magnetized. This can be done with a de-magnetizing rod and the procedure is as follows:

Switch off the cassette deck. Remove the lower head cover as shown in the figure. Switch on the de-magnetizer and move it slowly past the metal parts which are normally in contact with the tape. Make sure the rod does not **touch** the metal parts. Do not switch off the rod before it is at least *1 meter* away from the deck.
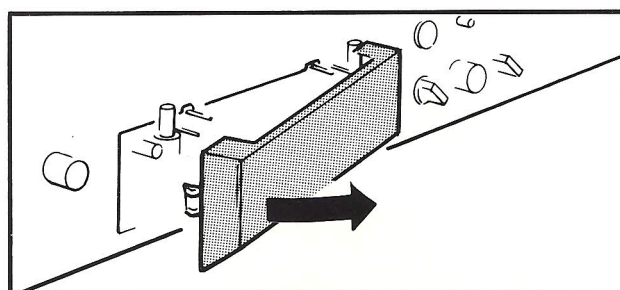
Options and accessories

Options and accessories available from your professional Tandberg dealer

— Cable remote control.

— 19 inch rack mount.

— Transformer balanced in and out instead of electronic balanced.

— Computer audio interface.

— Sidewalls in rosewood or black acrylic.

— A special heavy-duty cast dust cover to replace the standard moulded type.

— RS 232* data interface.

* Only available with balanced XLR in and out when ordered on TCD 910.

Options and accessories on special request

— Infra red wireless remote control.

— Custom software control packages.

— RCA phono in- and output (TCD 910 only).

Fitting the side panels

NOTE! When fitting extra side panels you must use the long screws (A) which are supplied.

Take care of the short screws (B) originally used to hold the side panels because you will need them if you remove the extra side panels. The long screws must not be used without the extra side panels because they will cause damage inside the deck.
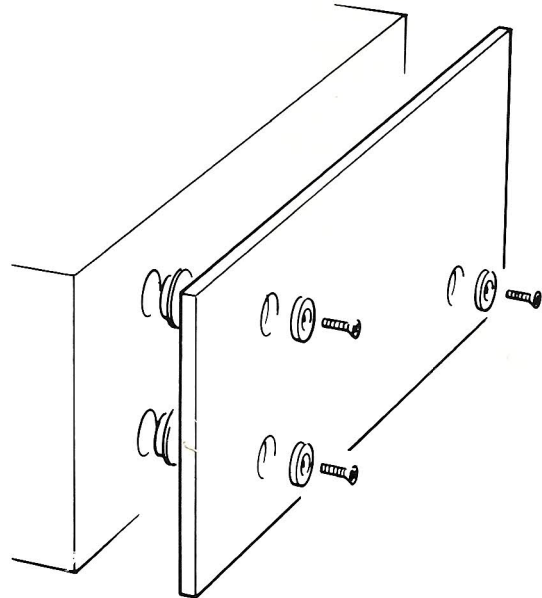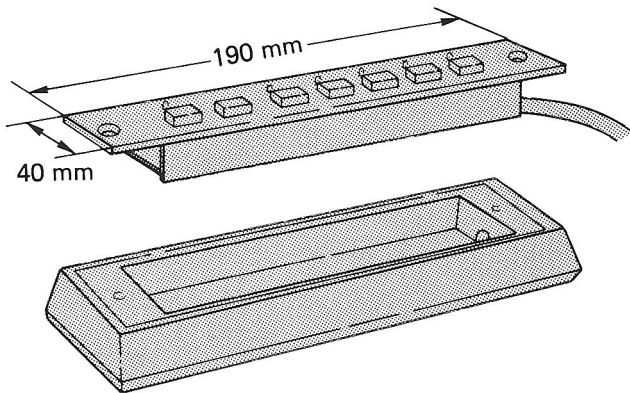
Fitting the 19''-rack mount kit
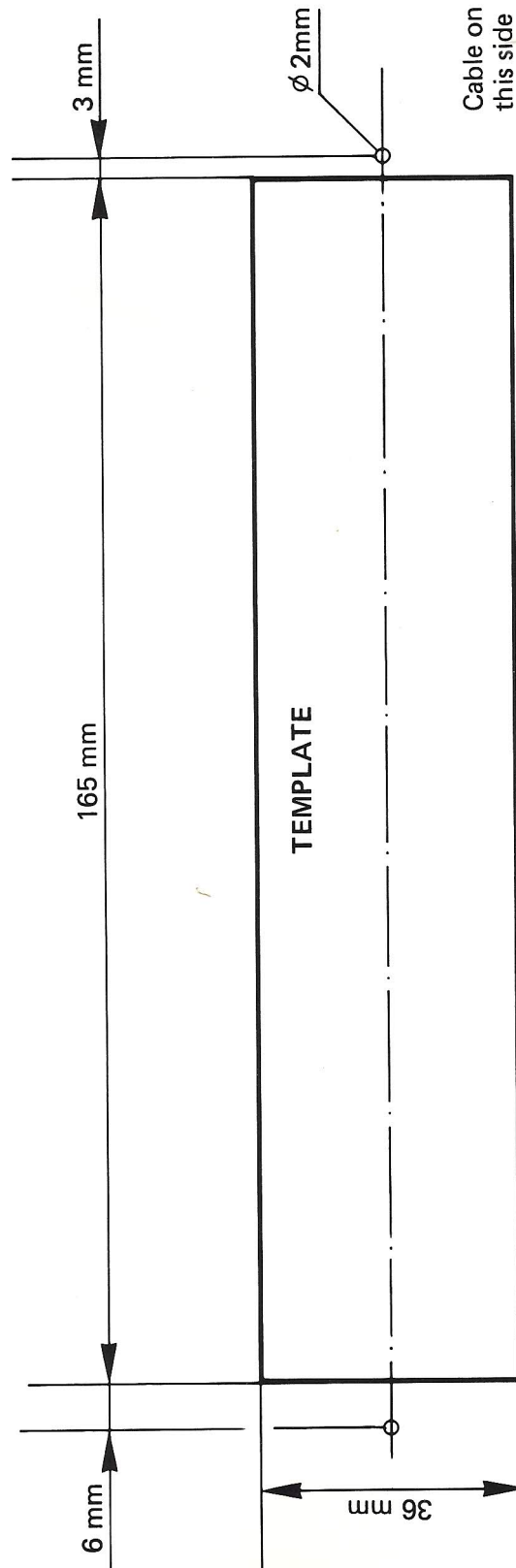
See figure.

18
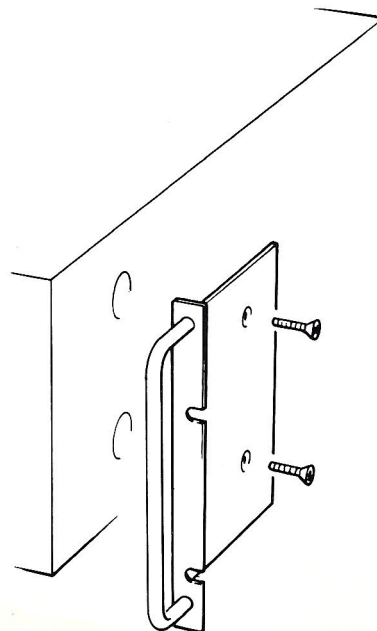
Cable remote control

General

The system consists of a control panel with cable installed in a foamed, soft plastic cabinet. The length of the cable is 6 m (19' 8'').

190 mm

40 mm

RC 900 for use with TCD 910
Item No. 7312

Functions
Play	Space
Stop	Recap
Record	Cut No
Wind	Cue
Rewind	

RC 900P for use with TCD 911
Item No. 7313

Functions
Play	Rewind
Stop	Cut No
Recap	Cue
Wind	

Connections

The figure is showing the socket on the back side of the deck.

⊥ black — 1
REWIND, brown — 14
2
CUE, orange — 15
3
WIND, white — 16
4
CUT, violet — 17
5
+ 5 V, red — 18
6
19
7
20 — PLAY, green/red
8 — WIND, white/red
RECORD, yellow — 21
PLAY, green — 9
STOP, blue — 22
10 — FADER START, pink
23 — STOP, red/blue   LED'S
11 — REWIND, red/black
24 — RECORD, yellow/red
12 — RELEASE, dark grey
25 — CUT, red/brown
13 — Turquoise

Installation

1/1 dimension for installation in a panel or table top.

3 mm

Ø 2mm

Cable on this side

165 mm

TEMPLATE

6 mm

36 mm

19

Block diagram

Specifications

Frequency response:
Record/Playback at — 20 dB rel. 250 nWb/m
Tape group I and II	20 — 20.000 Hz ± 2 dB
Metal IV	20 — 23.000 Hz ± 2 dB

Dolby B or Dolby C NR switched on
Tape group I	20 — 16.000 Hz ± 3 dB
Tape group II	20 — 18.000 Hz ± 3 dB
Metal IV	20 — 20.000 Hz ± 3 dB

Output level:
rel. 250 nWb/m
+ 6 dBu (European model)
+ 8 dBu (USA model)
adjustable from — 2 to + 12 dBu

Distortion (THD):
at 1 kHz 0 dB rel. 250 nWb/m Dolby NR
Tape group I	Better than 1.8%
Tape group II	Better than 2.8%
Metal IV	Better than 1.5%

Signal-to-noise ratio:
3% THD, A-weighted (noise band with 20 Hz — 20 kHz)
Tape group I	68 dB
Tape group II	71 dB
Metal IV	74 dB

Erase ratio at 1 kHz:
All tapes	min. 78 dB

Wow & Flutter:
acc. to DIN 45507/IEC 386 peak, weighted	0.1%

Crosstalk (1 kHz):
Side A — B	Better than — 80 dB
Track 1 — 2	Better than — 50 dB

Tape Speed: 4.76 cm/s (1 7/8 ips) ± 0.5%

Winding times: approx. 35 sec. for C-60
approx. 55 sec. for C-90

Input level:
for 0 dB level
rel. 250 nWb/m
Calibrated (0 dB level) = + 6 dBu
Adjustable from — 6 to + 22 dBu
(Calibrated position adjustable)

Inputs: Electronically balanced input impedance
> 40 kohm
up to 100 kHz

Outputs: Electronically balanced output impedance
< 30 ohm min. load impedance
> 300 ohm
10 Hz to 100 kHz

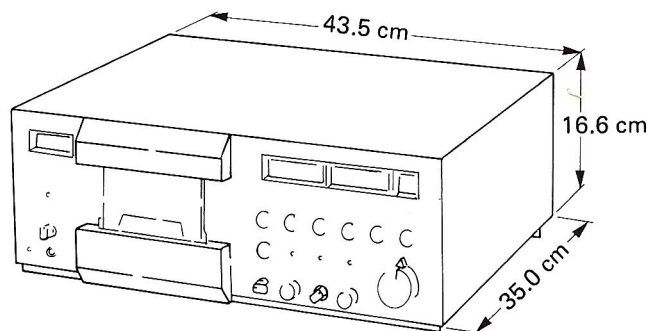**Level meter:** Symmetric PPM
(showing true record current)

Operating temperature range:
+ 15 to 32°C (59 . . . . 89.6°F)

Dimensions:
Width	43.5 cm (17 1/8")
Height	16.6 cm (6 9/16")
Depth	35.0 cm (13 ¾")
Weight	9.9 kg (21.8 lbs)

Specifications are subject to change without notice.