

# TANDBERG

Operating instructions  
tape recorder 13-22

Record button. The tape recorder is set in record mode when the button is depressed. The interlock button must be depressed in order to operate the record push-button.

The interlock button must be kept down when the record push-button is depressed.

Cartridge release button. The tape stops automatically and the cartridge is released when the button is depressed.

Record gain control for adjustment of the recording level. The control should, during recording, be adjusted until the pointer of the recording indicator reads up to the red area.

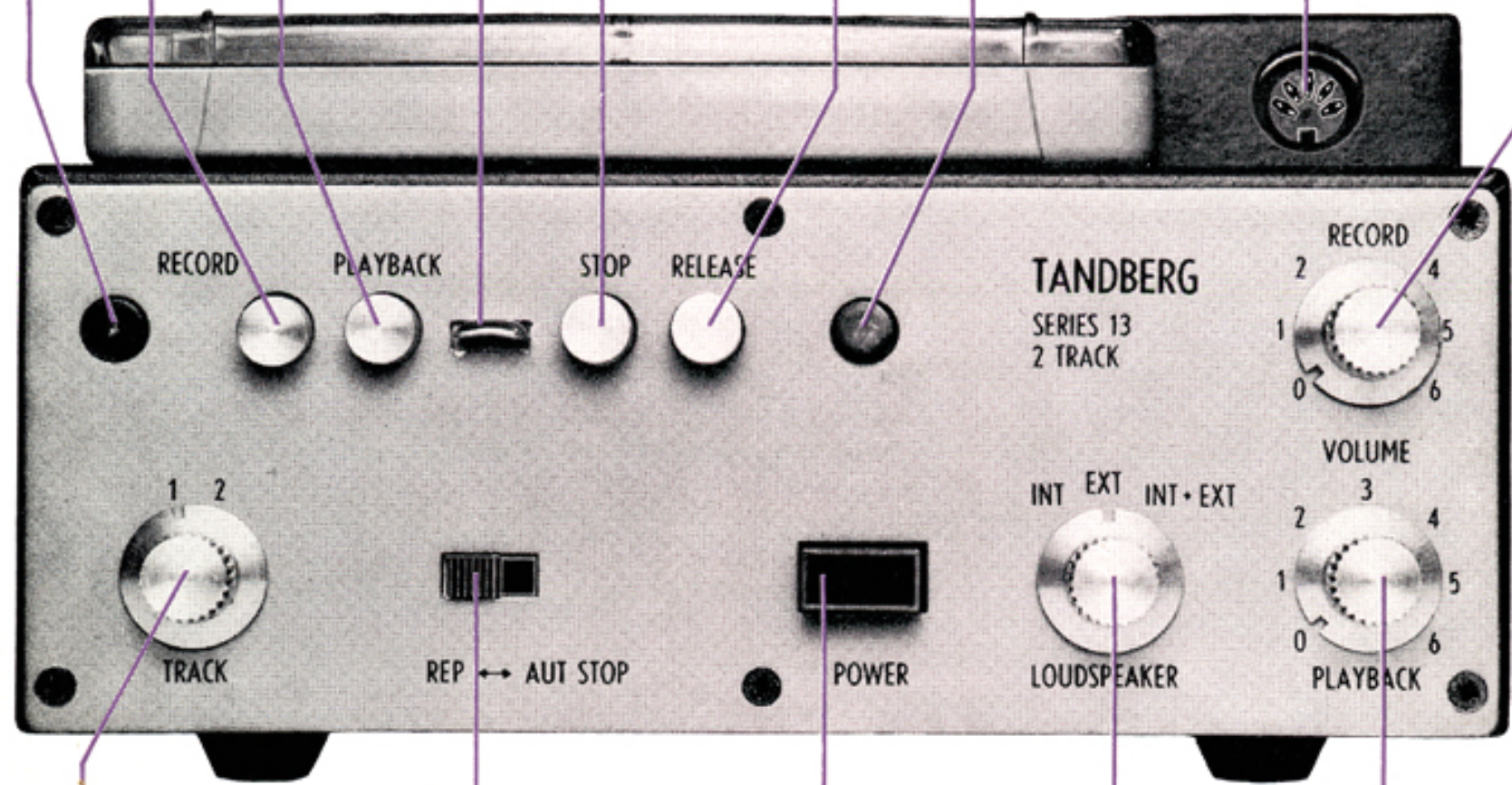
Signal light. Lights up when the tape recorder is set for recording.

Playback button. The tape recorder is connected from record to playback when the button is depressed.

Start/stop button. The tape stops instantaneously when the button is depressed.

Signal light. Lights up when the current is switched on.

Microphone contact. DIN connector for connection of dynamic microphone with impedance 200 ohms.



Track selector switch for selection between track 1 (upper track) and track 2 (lower track).

Switch for the automatic stop mechanism which stops the tape at the point or points where electrically conductive tape has been inserted.

Power switch. Switches mains current on and off.

3 position speaker selector switch. INT position: Internal speaker. EXT position: Auxiliary speaker. INT+EXT position: All speakers.

Volume control knob controlling the playback volume.



For connection of: **a)** Tandberg tape slide synchroniser. **b)** Separate playback amplifier for the track which is not played back through the built in amplifier of the recorder. **c)** Input from tape recorder 8F or 9F as language laboratory repeater system. **d)** Remote control of start/stop.

Contact for control of start/stop on models 8F-9F used as repeater system.

Inputs for signals from radio tuners, grammophones or other auxiliary equipment with low signal level. Output for connection to separate playback amplifier, the output signal is independent of the volume control.

Socket for connection of external speaker. Speaker impedance: 4 ohms.

# Operating instructions

Model 12-22 is a tape recorder for record and playback of tapes in Fidelipac cartridges. Controls and connections are shown on page 2 and 3.

**Mains voltage.** The tape player is set for 220 V 50 Hz. The current is switched on by depressing the button marked POWER. The red lamp will then light up.

**Track selection.** The TRACK switch gives the choice of playback or record on the upper track (position 1) or the lower track (position 2).

**Speaker selection.** An internal speaker is fitted and external speakers (4 ohms) may also be connected to the 2 pin socket (SPEAKER 4 ohms) in the rear panel. The switch marked LOUDSPEAKER provides speaker selection between the internal speaker, INT, external speaker EXT or all speakers in the INT + EXT position.

**Inserting the cartridge.** Push the cartridge fully home in the slot simultaneously exerting slight pressure to the right.

**Start.** The tape player is started by depressing the button marked POWER and pushing the cartridge fully home in the slot. The red signal light will light up and the tape will start automatically. The tape recorder may also be started by means of the STOP button. Depress the POWER and STOP buttons before inserting the cartridge and the tape will start when the STOP button is released.

**Stop.** The tape can be stopped instantaneously by means of the STOP button. The tape stops when the button is depressed, the cartridge remaining in the correct position allowing the

tape to re-start instantaneously as soon as the stop button is released.

## Playback

Start the tape recorder as outlined above.

**Playback volume.** The playback volume is controlled by means of the VOLUME PLAYBACK knob.

**Connecting an auxiliary playback amplifier.** An auxiliary playback amplifier can be connected to the free head output in the LINE socket in the same manner as described in the previous paragraphs. The playback amplifier must be equalized according to international standards and must be sensitive enough to pick up weak signals direct from the playback head. When an auxiliary amplifier is connected it is possible to play back two mono programmes simultaneously or one stereo programme.

When playing back two mono programmes, one programme will be played back through model 13-22 in the normal manner. The other programme will be played back through the auxiliary amplifier which must therefore be equipped with the necessary controls for volume control etc. When playing back a stereo tape, one track is played through model 13-22 and its speakers, while the other track is played back through the auxiliary amplifier with its speakers. The controls operate in the same manner as described for two mono programmes.

**Connecting an auxiliary power amplifier.** An auxiliary power amplifier can be connected to the RADIO socket. The signal level is independent of the position of the VOLUME PLAYBACK knob on the recorder.

**Removing the cartridge.** Depressing the RELEASE button stops the tape and releases the cartridge for removal.

**NB.** Never use force when removing the cartridge.

## Recording

**Inputs:** The tape recorder model 13-22 has three different inputs.

**The Microphone input** is located in front of the top cover and will match a 200 ohms dynamic microphone.

**The line input 10 kohms** is connected to pin 1 on the LINE socket.

**The line input 100 kohms** is connected to pin 2 on the RADIO socket. Pin no. 2 is connected to ground.

**Recording.** Press down the interlock button and hold while depressing the RECORD button. The yellow signal light on the left front side will light up indicating that a recording is being made.

**Ending the recording.** The recording is ended by depressing the PLAYBACK button. The tape recorder is thereby switched to playback, the yellow light is extinguished while the tape will proceed running.

The tape recorder will immediately stop and the cartridge be released when depressing the RELEASE BUTTON. The tape recorder will in this case, automatically be switched over to playback position and the yellow signal light will be extinguished.

**Automatic stop.** If you wish the tape recorder to stop automatically at a predestined point or points in the programme, electrically conductive tape (22-25 mm or 1" long) can be inserted

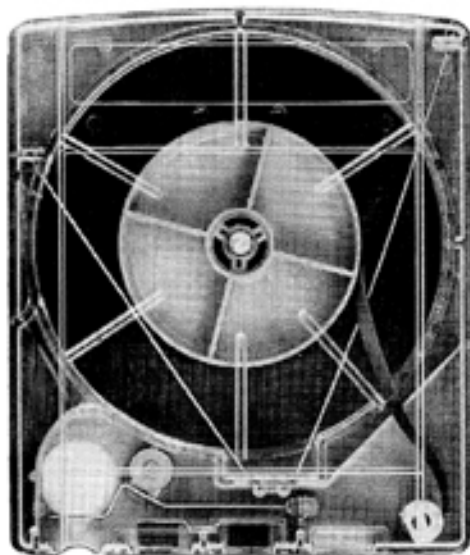
and spliced into the tape at the required positions. When the REP AUTO STOP switch is set at the AUT STOP position the tape will stop at the first stop tape. To recommence playing depress the STOP button and release again.

**Connecting a tape/slide synchroniser.** The track which is not being used for playback is automatically connected to an output (free head output) pin 3—6 in the LINE socket. A Tandberg tape/slide synchroniser for controlling an automatic slide projector can be connected to this output. The synchroniser should be connected to the LINE socket by means of a special cable. If a commentary to your slides is recorded on the tape's upper track (track 1) and the synchronising signals to the projector on the lower track (track 2), the track selector switch marked TRACK must be set at 1 during playback. If the commentary is recorded on the lower track (track 2) and the synchronising signals on the upper track (track 1) the track selector switch must be set at 2. The volume of the commentary is adjusted by means of the volume control knob and all other controls operate as described earlier.

**Repeater system.** The Tandberg tape recorder model 13-22 can be used in a one channel repeater system together with either model 8F or 9F. This system is well adapted to master programmes being played back in classrooms or in language laboratories.

**Remote control.** Starting and stopping the tape can be carried out by means of a remote control unit connected to the socket marked LINE at the rear of the tape recorder. When plugged in the remote control unit takes over all the functions of the STOP button. See the diagram showing connections on page 6.

## The cartridge



To operate properly the tape must be correctly placed in the cartridge and must be of a suitable quality. The spool must be correctly reeled and the tape must be able to slip. The tape must be coated with a suitable lubricant. Special tapes are now available which can be run hundreds of times without depositing lubricant on the heads or in the tape path in any way.

## Splicing the tape

To splice the tape, open the cartridge by removing the screw holding down the transparent plastic lid. Pull the tape out from the core and cut and splice

with splicing tape in the usual way. Make sure that the tape is replaced with the magnetic coating facing the slots at the front of the cartridge.

## Inserting stop tape

Stop tape can be inserted in the same manner as described in the previous paragraph. The length of the stop tape should be from 22 mm to 25 mm (1 inch).

## Cleaning the heads and pressure roller

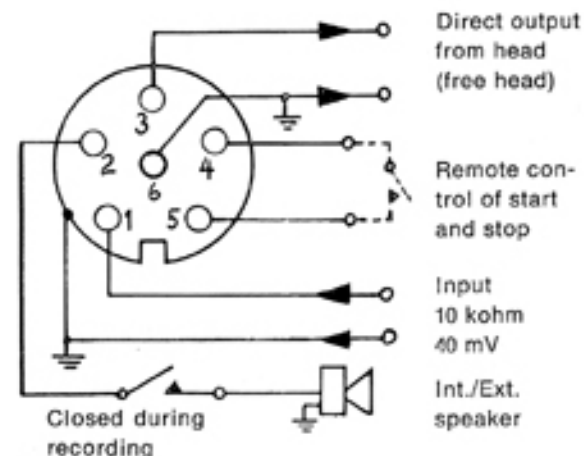
The head and tape guide posts should be cleaned occasionally and any film on the guide posts should be removed. Unscrew the three cross head screws which hold the top cover in place. There are two screws at the rear edge and one on top of the cover. Remove the cover. Dampen a clean piece of flannel with purified petrol (gasoline) and wrap around a small wooden stick or something similar. Do NOT use acetone or trichlorethylene which can cause damage. Clean the head and guide posts.

Replace the cover. The pressure roller should be cleaned with spirit occasionally as it gradually becomes coated with lubricant which can cause slipping.

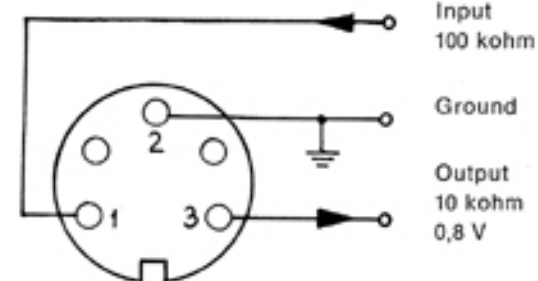
**NB.** The adjusting screws on the head must on no account be interfered with.

## Diagram showing connections for the LINE and REMOTE CONTROL sockets.

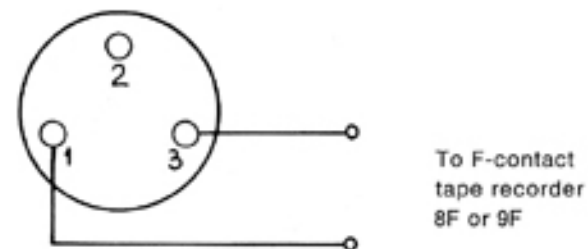
### LINE socket:



### RADIO socket:



### REMOTE CONTROL socket:



# Technical specifications

**Mains voltage:** 220 V 50 Hz or 115 V 60 Hz.

**Power consumption:** 38 W at 0,63 W output power.  
55 W at 5 W output power.

**Cartridges:** Fidelipac endless tape cartridges, 1200 ft, 600 ft and 300 ft.

**Tape movement:** The tape moves from left to right when seen from the front of the tape recorder. The head is positioned with the aperture towards the cartridge, i.e. towards the front of the tape player. The tape is pressed against the capstan by a rubber pressure roller.

**Tape:** Special tape such as Scotch 153 or Audiotape 17-3417.

**Tape speed:** 3<sup>3</sup>/<sub>4</sub>" per sec.

**Playing time:** Total playing time per tape (2 tracks)  
1200 ft.: 2 x 64 mins.  
600 ft.: 2 x 32 mins.  
300 ft.: 2 x 16 mins.

**Speed tolerance:** ± 2 ‰.

**Wow and flutter:** Better than .2 ‰.

**Instantaneous start/stop:** The tape can be started or stopped instantaneously during playback.

**Transistors:** 1 x AD161, 1 x AD162 (matched)  
1 x BC109C, 6 x BC113  
1 x TI3030, 3 x U2848  
1 x U2850, 3 x BC109

**Diodes:** 2 x AA119, 1 x OA81, 1 x 27V Zener.

**Bridge rectifier:** 1 x B40C2200.

**Relay:** 1 x 957/56 — 24 V.

**Heads:** One two-track erase head, type 48H.  
One two-track combined record/playback head,  
type 47H.

**Erase and bias frequency:** 85—90 kHz.

**Record level indicators:** Instrument, equalized according to the recording curves.

**Inputs:** One microphone input: (5 pins DIN connector) for dynamic microphone, 200 ohms, unbalanced. Sensitivity 0,1 mV. Two line inputs: 100 kohms, sensitivity 5 mV and 10 kohms, sensitivity 40 mV.

**Line output:** The line output is connected to the RADIO socket (pin 2 and 3). The output voltage is max 0,8 V across 10 kohms load. The signal level is independent of the position of the volume control.

**Free head output:** The track which is not being used for playback is automatically connected to the free head output in the LINE socket (pin 3 and 6). A Tandberg tape/slide synchroniser for controlling an automatic slide projector can be connected to this output. The Tandberg tape recorder models 8F or 9F can be connected to the LINE socket for use as a repeater system in a language laboratory. The remote contact on model 8F respectively 9F must then be connected to the socket marked REMOTE CONTROL.

**External speaker output:** External speakers may be fitted to the 2 pin socket marked SPEAKER 4 ohms. Maximum output power is 5 watts across 4 ohms. The distortion is less than 1 ‰. The recording level meter is adjusted so that the tape will give less than 5 ‰ harmonic distortion when playing back a 400 Hz signal recorded to indicated mark on the meter. The distortion will be less than 1 ‰ if the signal is reduced 10 dB during the recording.

**Signal to noise ratio:** Better than 50 dB when played back on tape which is recorded to 5 ‰ distortion.

**Frequency response:** ± 3 dB 50 Hz — 10 kHz.

**Track selector:** Electric track selector.

**Automatic stop:** Insertion of a 22 to 25 mm (1") metallic tape strip causes the tape to stop every time this passes the capstan. A selector switch provides selection between automatic stop and continuous repetition.

**Built in speaker:** One 3" x 8" speaker, 8 ohms.

**Speaker selector:** 3 positions: Internal, external and all speakers.

**Dimension:** Width: 21 cms (8<sup>1</sup>/<sub>2</sub>" ), Height: 11 cms (4<sup>3</sup>/<sub>4</sub>" ), Depth: 24,5 cms (9<sup>5</sup>/<sub>8</sub>" ).

**Weight:** 5,5 kilos (11<sup>1</sup>/<sub>2</sub> lb).

# TANDBERGS RADIOFABRIKK A/S

KJELSÅSVEIEN 161  
OSLO - NORWAY



DIV. KJELSÅS



DIV. KJELLER

Continuous research, advanced designs and exacting inspection of both components and finished products are factors which have helped to make the name Tandberg famous for quality all over the world. Another fundamentally important fact is that the uncompromising demand for quality is shared by every one of the 1300 employees at Tandbergs Radiofabrikk A/S. Tandberg has always considered that inspiring and pleasant working conditions are of the greatest importance. The modern plants in pleasant surroundings, an advanced personnel policy and considerable social benefits combine to produce an unique team purposefully working to strengthen and develop Tandberg's world wide renown for quality products.

DEALER