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FERROGRAPH

SERIES SEVEN

FERROGRAPH

The Series 7 marks the latest development in the sequence of high grade magnetic tape recorders that have established the reputation of Ferrograph in this field over more than 20 years. Throughout this time, Ferrograph recorders have been renowned for the ruggedness of their construction and for exceptional reliability even under the most strenuous service conditions. The Series 7 continues this great tradition in a design that combines a clean and up-to-date styling with a wealth of facilities that are not usually available in machines of this type. Series 7 will therefore appeal to users who wish to employ modern multi-track recording techniques no less than to those whose primary requirements are first rate sound quality, simple and secure operation and extreme reliability.

Each machine in the Series 7 range can be switched instantly to operate with any one of three tape speeds, $7\frac{1}{2}$, $3\frac{3}{4}$ and $1\frac{7}{8}$ in/s (19, 9.5 and 4.75 cm/s) for standard models, 15 , $7\frac{1}{2}$ and $3\frac{3}{4}$ in/s (38, 19 and 9.5 cm/s) for the high speed (Suffix H) types. The 8 models of the range also offer facilities for $\frac{1}{2}$ track or $\frac{1}{4}$ track recording, with single channel (mono-phonetic) or with two channels (stereophonic) and models are available either with or without a built-in loudspeaker and loudspeaker amplifier for each channel. Machines are normally supplied in portable form in a leathercloth covered carrying case but all models are also available in a case with a natural wood finish or fitted with brackets that enable the machine to be mounted in a standard 19 inch rack.

All Series 7 recorders have exceptionally good "quick start" characteristics together with a good signal-to-noise ratio, an excellent frequency response and very low wow and flutter. They are backed by the Ferrograph Service Organisation and carry a 3 year guarantee for the free replacement of defective parts.

PRINCIPAL MECHANICAL FEATURES

3 motors, 3 heads, 3 speeds.

A built-in loudspeaker and loudspeaker amplifier for each channel (except models 702, 702H and 704).

The record/replay electronics, the combined power supply and loudspeaker amplifier and the deck with its solenoids are built as three separate sub-assemblies with plug and socket connectors. These three sub-assemblies are mounted in a framework from which they can readily be detached and which can itself readily be removed from the carrying case. This construction greatly simplifies servicing.

Spooling speed continuously variable from full in one direction to full in the other facilitates finding a particular place in a recording. A 4-digit, one-press-to-reset indicator enables a given point to be found again quickly.

Very quick start. Machine is recording or reproducing satisfactorily after about one tenth of a second.

Automatic stop at the end of the tape or in case of tape breakage.

Automatic stop at any point pre-selected by a piece of adhesive metal foil placed on the tape.

Solenoid operation of the pinch wheel enables starting and stopping to be remotely controlled.

Similarly, a machine that is to be started by a time switch can stand unpowered until the switch operates.

Machine accommodates spools up to 8 in (210 mm) in diameter.

The height of each reel can be adjusted independently while the machine is running to allow for the different thicknesses of metal and plastic spools.

Machines can be operated in a horizontal or a vertical position.

The brakes can be adjusted from the front of the machine without removing covers.

Large retractable carrying handle.

PRINCIPAL ELECTRICAL FEATURES

All-silicon, solid-state electronics with FET Line Input stages giving high input impedance and wide overload margin.

A separate VU meter and a separate bias adjustment for each channel.

Two simultaneous inputs for each channel (Microphone and Line) each with its own gain control.

Three simultaneous outputs for each channel (600 ohms, Low Level and Loudspeaker) on all models that include a loudspeaker amplifier. On these models the Loudspeaker Output can deliver 10 watts rms into an external loudspeaker or similar load.

The main controls on the face of the amplifier vary the gain of the Microphone and Line Input amplifiers and control the level from the loudspeakers (if fitted).

Subsidiary controls are immediately accessible on a sub-panel at the front of the machine but are protected against accidental disturbance by a hinged flap. The subsidiary controls provided for each channel include:—

a pre-set adjustment for the level at the 600 ohm and Low Level Outputs.

bass and treble controls for the Low Level Output and for the loudspeaker and Loudspeaker Output (when fitted).

pre-set adjustment of bias current.

a switch to connect the 600 ohms and Low Level Outputs and the loudspeaker and the Loudspeaker Output (when fitted) either to the input or to the output of the machine.

a switch to connect the VU meter so as to measure recording level, reproduced level or bias current

Input and output connections are carried on a recessed panel at the back of the machine and can be covered by a hinged flap for protection during transit.

"Off-the-tape" monitoring can be carried out while recording.

Safety catch on RECORD push button.

The machine can be put into or out of the RECORD mode without stopping the tape and without causing clicks or pops.

Red indicator lamp and VU meters light up to show when the machine is in the RECORD mode.

The machine can be switched to act as a microphone-to-loudspeaker amplifier with gain and tone controls and capable of delivering an output of 10 watts rms from each channel.

On stereophonic machines, a Transfer Switch connects the output from either channel to the input to the other channel so that signals can be transferred from track to track without using external connections.

The usefulness of stereophonic machines is not confined to stereophonic sound recording. When such machines are used for recording instrumentation data in the audio frequency range, two sets of data can be recorded synchronously on the two tracks. Moreover, by the use of the transfer and monitor switches, a wide range of additional facilities for monophonic sound recording become available at small additional cost. For example:—

the combined signal from the Microphone and Line Inputs of one channel can be added to the combined signal from the Microphone and Line Inputs of the other channel so that four separate inputs may be combined, as with a mixer, and recorded monophonically on one track.

a delayed signal obtained from the replay head on one track can be combined with the input signal to the other track to obtain "echo" effects.

the reproduction of, say, a vocalist recorded on one track can be re-recorded on the other track with another voice part or an instrumental accompaniment added and the process can be repeated so that the recording of an ensemble can be built up from consecutive performances even of a single performer.

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ACCESSORIES

The scope of a Ferrograph recorder can be further extended by the use of a range of accessories that is listed in the Ferrograph Audio Accessories Catalogue. The range includes a Signal Operated Switching Unit which enables the recorder to start automatically on the arrival of the signal that is to be recorded, an endless loop tape cassette, a transparent plastic lid and a waterproof cover for use in transit.

LIST OF MODELS

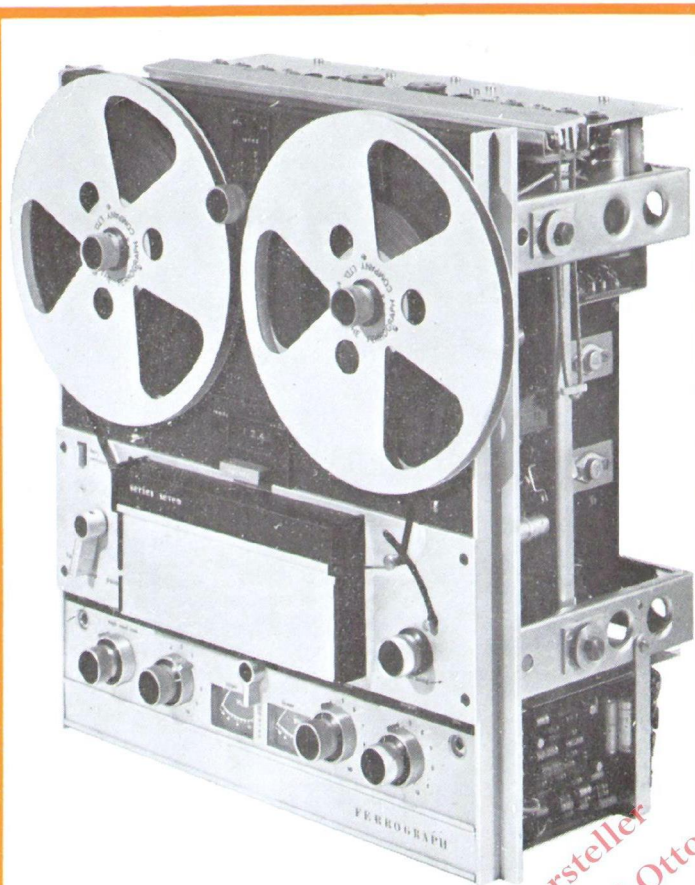
Model	1 channel (Mono) or 2 channels (Stereo)	Size of Track	Tape Speed in/s	Tape Speed cm/s	
713	Mono	$\frac{1}{2}$	$7\frac{1}{2}$, $3\frac{3}{4}$, $1\frac{7}{8}$	19, 9.5, 4.75	One loudspeaker and power amplifier
713H	Mono	$\frac{1}{2}$	15 , $7\frac{1}{2}$, $3\frac{3}{4}$	38, 19, 9.5	One loudspeaker and power amplifier.
702	Stereo	$\frac{1}{2}$	$7\frac{1}{2}$, $3\frac{3}{4}$, $1\frac{7}{8}$	19, 9.5, 4.75	No loudspeakers or power amplifiers.
702H	Stereo	$\frac{1}{2}$	15 , $7\frac{1}{2}$, $3\frac{3}{4}$	38, 19, 9.5	No loudspeakers or power amplifiers.
722	Stereo	$\frac{1}{2}$	$7\frac{1}{2}$, $3\frac{3}{4}$, $1\frac{7}{8}$	19, 9.5, 4.75	Loudspeaker and power amplifier for each channel.
722H	Stereo	$\frac{1}{2}$	15 , $7\frac{1}{2}$, $3\frac{3}{4}$	38, 19, 9.5	Loudspeaker and power amplifier for each channel.
704	Stereo	$\frac{1}{2}$	$7\frac{1}{2}$, $3\frac{3}{4}$, $1\frac{7}{8}$	19, 9.5, 4.75	No loudspeakers or power amplifiers.
724	Stereo	$\frac{1}{2}$	$7\frac{1}{2}$, $3\frac{3}{4}$, $1\frac{7}{8}$	19, 9.5, 4.75	Loudspeaker and power amplifier for each channel.

Alternatives

- Suffix P Portable wooden case, leathercloth covered, with lid.
- Suffix W Wooden case, natural wood finish.
- Suffix R Rack mounting version.
- Suffix A For 117 V, 60 Hz power supply.

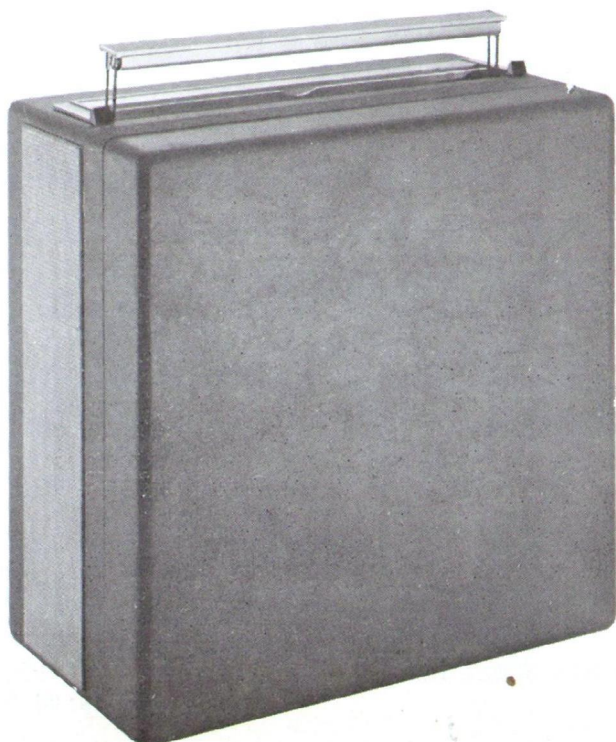
Thus, 722HWA is a stereophonic half track machine with tape speeds of 15, $7\frac{1}{2}$ and $3\frac{3}{4}$ in/s in a natural wood finish case, operating on 117 V, 60 Hz.

Note: If no suffix is quoted it will be assumed that a 40 V, 50 Hz, $7\frac{1}{2}$, $3\frac{3}{4}$, $1\frac{7}{8}$ in/s machine in a portable case is intended.



Recorder removed from case; carrying handle retracted

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Recorder showing the retractable handle in the carrying position

TECHNICAL SPECIFICATION

INPUT LEVELS AND IMPEDANCES

Microphone Input	
Input Level for full amplitude recording	300 μ V-15mV
Input Impedance	10,000 ohms
Recommended Source Impedance	250-2,000 ohms
Line Input	
Input Level for full amplitude recording	50 mV - 10 V
Input Impedance	2 Megohms
Recommended Source Impedance	Any

OUTPUT LEVELS AND IMPEDANCES

600 ohm Output	
Output Impedance	600 ohms
Recommended Load	600 ohms
Output Level into Recommended Load	1 V
Low Level Output	
Recommended Load	10,000 ohms or more
Output Level into Recommended Load	300 mV
Loudspeaker Output	
Recommended Load	8 to 16 ohms
Power into Recommended Load	10 watts rms (per channel)

TAPE SPEEDS

Standard Models	
	7½, 3¾ and 1¾ in/s (19, 9.5 and 4.75 cm/s)
H Models	
	15, 7½ and 3¾ in/s (38, 19 and 9.5 cm/s)

RECORDING/REPLAY CHARACTERISTICS

at 15 in/s (38 cm/s)	35 μ s
at 7½ in/s (19 cm/s)	50 + 3180 μ s
at 3¾ in/s (9.5 cm/s)	90 + 3180 μ s
at 1¾ in/s (4.75 cm/s)	120 + 1590 μ s

BASS CONTROL

Continuously variable up to
± 15 dB at 50 Hz; ± 20 dB at 20 Hz

TREBLE CONTROL

Continuously variable up to
± 10 dB at 10 kHz; ± 15 dB at 20 kHz

MAXIMUM SPOOL SIZE

8¼ in (210 mm) diameter

PLAYING TIME PER TRACK

Standard Play Tape (1750 ft; 530m)	46 minutes at 7½ in/s
Long Play Tape (2400 ft; 730 m)	64 minutes at 7½ in/s

INTERNAL LOUDSPEAKERS

7 x 4 in (178 x 102 mm) elliptical; 30 ohms

POWER SUPPLY

Standard Models	200-250 V, 50 Hz
Models with suffix A	117 V, 60 Hz

POWER CONSUMPTION

100 watts, approximately.

OVERALL DIMENSIONS

Portable Models, including lid, 16¾ in (425 mm) wide;
17½ in (445 mm) high; 10 in (254 mm) deep.

WEIGHT

49½ lbs (22.5 kg) approx.

PERFORMANCE SPECIFICATION

OVERALL FREQUENCY RESPONSE

Record/Replay (using Long Play Ferrotape Type B)	
15 in/s (38 cm/s)	40-20,000 Hz within ± 2 dB
7½ in/s (19 cm/s)	40-17,000 Hz within ± 2 dB
3¾ in/s (9.5 cm/s)	40-14,000 Hz within ± 3 dB
1¾ in/s (4.75 cm/s)	50- 7,000 Hz within ± 3 dB

AMPLIFIER DISTORTION

Less than 0.25% rms at all levels up to 10 watts output.

SIGNAL TO NOISE RATIO

For ½ track at 7½ in/s (19 cm/s)
Unweighted better than 55 dB at 2% distortion level.
Weighted (CCIF)
better than 60 dB at 2% distortion level.

CHANNEL CROSSTALK (Stereo Models)

At 1 kHz
Better than 65 dB in monophonic mode.
Approximately 50 dB in stereophonic mode.

WOW AND FLUTTER

% rms less than :—

	Standard Models	High Speed Models (Suffix H)
15 in/s (38 cm/s)		0.08
7½ in/s (19 cm/s)	0.08	0.10
3¾ in/s (9.5 cm/s)	0.15	0.15
1¾ in/s (4.75 cm/s)	0.20	

MEAN SPEED ACCURACY

Better than ± 1% (at specified supply frequency)

FAST WIND TIME

Continuously variable in either direction. Less than 1 minute required for 1200 ft (360 m) of tape.

THE FERROGRAPH COMPANY LTD

ALLEEN VERTEGENWOORDIGING VOOR NEDERLAND:

RECORD RENDEZ-VOUS

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