

SERIES Y RECORDERS
for
SCIENCE AND INDUSTRY
and
PROFESSIONAL SOUND
RECORDING



eller
Michael Otto
HiFi-Classic.de

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FERROGLYPH

FERROGRAPH SERIES Y RECORDERS

The Series Y is a range of magnetic tape recorders derived directly from the standard Ferrograph Series 7 range but specially adapted for audio frequency instrumentation recording in scientific and industrial applications and for professional sound recording.

Series Y machines are available in single channel and two-channel forms recording full track, half track or quarter track on standard $\frac{1}{4}$ inch wide magnetic tape. The two-channel models can be used for stereophonic recording and reproduction and there is a four-channel "reproduce only" machine that is suitable for replaying four-channel stereophonic (Quadraphonic) commercial tape records.

They may be used in either a horizontal or a vertical position and brackets are available that enable them to be mounted in standard 19-inch racks. Portable machines are housed in strong metal cases that give protection against rough treatment in transit as well as providing electrostatic screening and these machines are therefore particularly well adapted for mobile use in boats, vans, cars and other vehicles.

Each machine in the Series Y range can be switched to 3 different tape speeds, the standard models to $7\frac{1}{2}$, $3\frac{3}{4}$ and $1\frac{7}{8}$ in/s and the high speed (H) and low speed (L) versions to 15, $7\frac{1}{2}$ and $3\frac{3}{4}$ or $3\frac{3}{4}$, $1\frac{7}{8}$ and $\frac{1}{16}$ in/s respectively. All machines will accommodate reels up to $8\frac{1}{4}$ inches in diameter and the height of the reels can be adjusted, while the machine is running, to allow for the different thicknesses of metal and plastic spools.

Input and output arrangements are very flexible and comprehensive. Each channel has two independent inputs that can be used simultaneously, each with its own gain control, and there are three outputs. One input and one output are isolated from ground. All machines have a digital tape position indicator, adjustable bias and a VU meter for each channel that can be switched to measure input level, output level or bias current. All machines have exceptionally good quick-start characteristics, a feature that is of great value in some applications.

Series Y machines are of very robust construction and are suitable for continuous operation over long periods. This, combined with a good signal-to-noise ratio, excellent frequency response and very low wow and flutter makes the machines well suited to a wide variety of applications that involve the recording of high quality sound or of audio frequency instrumentation data under strenuous service conditions.*

In addition to the Series Y there are similar Series P machines that are still further adapted for the special needs of sound recording in radio, television and similar applications. The special features of the Series P machines are detailed in a separate leaflet.

Series Y machines with other head configurations, non-standard recording and reproducing equalisations and other special features are made to order and enquiries are always welcome.

PRINCIPAL MECHANICAL FEATURES

3 motors, 3 heads, 3 speeds.

A built-in monitor loudspeaker and power amplifier for each channel.

The record/replay electronics, the combined power supply and output stage 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 and maintenance.

Spooling speed continuously variable from full in one direction to full in the other facilitates finding a particular place in a recording. A four 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.

Solenoid operation of the pinch wheel enables starting and stopping to be remotely controlled. Similarly, the machine can be set to operate from a time switch without power being applied.

Machine accommodates spools up to 8½ inches in diameter.

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

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

Portable machines are housed in strong metal cases and have a large retractable carrying handle.

PRINCIPAL ELECTRICAL FEATURES

All silicon, solid state electronics.

Two simultaneous inputs for each channel, Microphone and Line, each with its own gain control. The Line Input is isolated from ground and centre tapped.

Three simultaneous outputs for each channel as well as a connection for headphones. The 600 ohm Output is isolated from ground and centre tapped. 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 loudspeaker(s).

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 for each channel include:—

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

Bass and treble controls for the loudspeaker and the Low Level and Loudspeaker Outputs.

pre-set adjustment of bias current.

switch to connect the loudspeaker, the headphones and the 600 ohms, Low Level and Loudspeaker Outputs either to the input or to the output of the machine.

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.

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

Red indicator lamps 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 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 any external connections.

The usefulness of stereophonic machines is not confined to stereophonic sound recording. In instrumentation work, two sets of data can be recorded synchronously on the two tracks and, by the use of the transfer and monitor switches, a wide range of additional facilities for monophonic sound recording becomes 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 accompaniment added and the process can be repeated so that the recording of an ensemble can be built up even from a single performer.

ACCESSORIES

The scope of a Ferrograph recorder can be further extended by the use of a range of accessories listed in the Ferrograph Audio Accessories Catalogue. The range includes a Signal Operated Switching Unit which enables a recorder to start automatically on the arrival of the signal that is to be recorded, an endless loop tape cassette, a transparent plastic dust cover and a waterproof cover for use in transit. There is also a Telephone Circuit Adaptor Unit. Used in conjunction with this Adaptor, Series Y machines have been approved by the G.P.O. for connection to its telephone circuits.



SIGNAL OPERATED SWITCHING UNIT

LIST OF MODELS

Model	Mono (1 track) or Stereo (2 tracks)	Size of track	Tape Speed in/s	Tape Speed cm/s
Y715 Y715H	Mono Mono	Full Full	7½, 3¾, 1⅞ 15, 7½, 3¾	19, 9.5, 4.75 38, 19, 9.5
Y713 Y713H Y713L	Mono Mono Mono	½ ½ ½	7½, 3¾, 1⅞ 15, 7½, 3¾ 3¾, 1⅞, 1⅞	19, 9.5, 4.75 38, 19, 9.5 9.5, 4.75, 2.37
Y722 Y722H Y722L	Stereo Stereo Stereo	½ ½ ½	7½, 3¾, 1⅞ 15, 7½, 3¾ 3¾, 1⅞, 1⅞	19, 9.5, 4.75 38, 19, 9.5 9.5, 4.75, 2.37
Y724L	Stereo	¼	3¾, 1⅞, 1⅞	9.5, 4.75, 2.37
Y708*	Stereo (4 tracks)	¼	7½, 3¾, 1⅞	19, 9.5, 4.75

*This is a "replay only" machine for reproducing simultaneously the 4 tracks of Quadraphonic stereophonic tape records. For the detailed specification of this machine refer to the Ferrograph Co. Ltd.

TECHNICAL SPECIFICATION

INPUT LEVELS AND IMPEDANCES

Microphone Input	
Minimum level for full amplitude recording	
Models Y715 and Y715H	600 μ V
All other Y models	300 μ V
Input Impedance	10,000 ohms
Recommended Source Impedance	250 to 2,000 ohms
Line Input (isolated with centre tap)	
Minimum level for full amplitude recording	
Models Y715 and Y715H	300 mV
All other Y models	150 mV
Input Impedance	10,000 ohms
Recommended Source Impedance	600 ohms

OUTPUT LEVELS AND IMPEDANCES

600 ohm Output (isolated with centre tap)	
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 1⅞ 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)
L Models	3¾, 1⅞ and 1⅜ in/s (9.5, 4.75 and 2.37 cm/s)

RECORDING/REPLAY CHARACTERISTICS

at 15 in/s (38 cm/s)	IEC	35 μ s
at 7½ in/s (19 cm/s)	IEC	70 μ s
at 3¾ in/s (9.5 cm/s)	IEC	90 + 3180 μ s
at 1⅞ in/s (4.75 cm/s)	IEC	120 + 1590 μ s

BASS CONTROL

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

TREBLE CONTROL

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

MAXIMUM SPOOL SIZE

8½ in diameter

PLAYING TIME PER TRACK

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

INTERNAL LOUDSPEAKERS

One per channel; 7 x 4 in (17.8 x 10.2 cm) elliptical;
30 ohms.

POWER SUPPLY

200 to 250 V, 50 Hz (Models with suffix A, 117 V, 60 Hz)

POWER CONSUMPTION

100 watts, approx.

OVERALL DIMENSIONS

16¾ in (425 mm) wide, 17½ in (445 mm) high, 10 in (254 mm) deep with lid.

WEIGHT

Approx. 50 lbs (23 kg)

PERFORMANCE SPECIFICATION

OVERALL FREQUENCY RESPONSE (Record/Replay)

at 15 in/s (38 cm/s)	40-20,000 Hz within ± 2 dB
at 7½ in/s (19 cm/s)	40-17,000 Hz within ± 3 dB
at 3¾ in/s (9.5 cm/s)	40-12,000 Hz within ± 3 dB for model Y715
	40-14,000 Hz within ± 3 dB for other models
at 1⅞ in/s (4.75 cm/s)	50-6,000 Hz within ± 3 dB for model Y715
	50-7,000 Hz within ± 3 dB for other models
at 1⅜ in/s (2.37 cm/s)	60-3,000 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 tape speeds of 3¾ in/s (9.5 cm/s) and above:
Unweighted better than 55 dB at 2% distortion level
Weighted (CCIF) better than 60 dB at 2% distortion level

CHANNEL CROSSTALK

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

WOW AND FLUTTER

% rms less than:—

	H model	Standard model	L model
15 in/s (38 cm/s)	0.08		
7½ in/s (19 cm/s)	0.10	0.08	
3¾ in/s (9.5 cm/s)	0.15	0.15	0.15
1⅞ in/s (4.75 cm/s)		0.20	0.20
1⅜ in/s (2.37 cm/s)			0.40

MEAN SPEED ACCURACY

Models Y715 and Y715H at
15 and 7½ in/s (38 and 19 cm/s) $\pm 0.5\%$
All other models and speeds $\pm 1.0\%$

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:

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FERD. BOLSTRAAT 26-28 - TELEFOON 79 39 00 - 79 76 87