



DEVELOPMENT STANDARD

QIC-126
Revision D
15 Jun 94

MAGNETIC RECORDING HEAD FOR USE IN 1 GB
QIC-1000-DC CARTRIDGE DRIVES, 2 GB (C)
CARTRIDGE DRIVES AND 840 MB, QIC 3040 (MC)
MINI CARTRIDGE DRIVES

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REVISION HISTORY

QIC- 126

Revision Level	Detail	Revision Date
Revision D	Added requirement to specify recording head	
	for operation in the QIC 3040 (MC) tape drive	6/15/94

This document defines those parameters standardized on the magnetic tape head utilized in the Q1C-1000, QIC 2 GC(C) cartridge tape drivers and in the QIC-3040 (MC) mini-cartridge tape drive.

This head is a two-channel, dual gap, read-while-write element in serpentine mode, with a full width erase gap. It is designed for use with DC9100, 900 Oe or equivalent cartridge and has packing densities of 45,000 and 50,800 FRPI and track densities of 30 and 42 respectively with QIC-1000 and QIC 2 GB(C) drive formats.

In its mini-cartridge mode, the head is of the same construction detail. It is however, designed for use with DC 2840, 900 Oe or equivalent cartridge and has a packing density of 50,800 FRPI and a track density of 42 with the QIC 3040 (MC) tape drive format.

1.0 **MECHANICAL REQUIREMENTS**

1.1 Physical Dimensions and Track Layout are detailed in Figure 1.

2.0 **ELECTRICAL AND MECHANICAL KEY SPECIFICATIONS**

	Parameter	Units	QIC-1000	QIC 2 GB(C)
2.1	Tape	---	DC9100	DC9100
2.2	Tape Speed	IPS	53.3	70.9
2.3	Head Construction	---	Read- while-write	Read-while-write
2.4	Recording Density	FRPI	45,000	50,800
2.5	Erasure	%	< 3	< 3
2.6	Erase Frequency	MHz	4.8 minimum	7.2 minimum
2.7	Peak Shift	%	± 28	± 28
2.8	Resolution	%	55 minimum	55 minimum
2.9	1F Output	mV p-p	0.5 minimum	0.5 minimum
2.10	Read Resonant Frequency	MHz	> 2.0	> 3.0
2.11	Crossfeed	%	5 maximum	5 maximum
2.12	Crosstalk	%	500 maximum	500 maximum
2.13	Read ETW (A)	inch	$0.0035 \pm .00015$	$0.003 \pm .00015$
2.14	Write ETW (B)	inch	0.007 ± 0.00015	$0.007 \pm .00015$
2.15	Track Pitch (C)	inch	$0.1205 +0.001$ -0.000	$0.1207 +0.001$ $- 0.000$
2.16	Track Centerline Tolerance (D)	inch	0.0003 typ.	0.0005 maximum

3.0 DEFINITIONS for 1 GB and 2 GB (C) Heads

- 3.1 Both heads employ read-while-write data verification, so that the data recorded is read and verified on the same pass as it was recorded.
- 3.2 The recording format for both heads is NRZI.
- 3.3 No overwrite is required from either head. An A.C. erase head is to be provided as a separate full tape width erase gap. The erase specification indicated in (2.5) is a measure of the residual 1F signal (at 45,000 and 50,800 respectively), after A.C. erasure.
- 3.4 The peak shift specification in (2.7) is defined as below. The instantaneous spacings between flux transitions shall satisfy the following conditions: In a sequence of flux transitions defined by the encoded pattern 0101001011. (hex 29 data pattern), the maximum displacement of flux transitions shall not exceed the specification from the nominal bit cell averaged over the six transition cells between the reference flux transitions.
- 3.5 A.C. Bias (optional). A high frequency A.C. bias write current with the write signal current superimposed may be used as a recording method. No current values as bias frequency will be set at this time.
- 3.5 Resolution. With the recording method used, a 3:1 ratio in transition densities may occur. The resolution value is determined as the ratio indicated below:

$$\text{Resolution} = \frac{E_o @ 1F}{E_o @ 1/3F}$$

Where 1F = 45,000 FRPI for 1GB operation and 50,8000 FRPI for 2 GB operation.

- 3.7 The read resonant frequency is defined with a 10 pf load.
- 3.8 The write saturation current (I_{sat}) is defined as the current value at the first 95% of the maximum read output (without A.C. bias) at 1 F.

- 3.9 The write current (I_w) used in the two heads is defined as 115% of I_{sat} , (without A.C. bias).
- 3.10 Crossfeed is defined as the ratio of the signal through the read coil with the write coil under test energized at 1F and at I_w , to the "read-while-write" output signal at 1F. The measurement is facilitated using a spectrum analyzer set at 100 KHz to 2.0 MHz.
- 3.11 Crosstalk is defined as the ratio of the signal through the adjacent read coil on the same gap with the write coil under test energized at I_w at 1F to the "read-while-write" output signal at 1F. The measurement is facilitated using a spectrum analyzer set at 100 KHz to 2.0 MHz.

4.0 ELECTRICAL AND MECHANICAL KEY SPECIFICATIONS

	Parameter	Units	QIC-3040 (MC)
2.1	Tape	-----	DC2840
2.2	Tape Speed	IPS	70.9
2.3	Head Construction	-----	Read-while-write
2.4	Recording Density	FRPI	50,800
2.5	Overwrite	dB	< -24
2.6	Peak Shift	%	± 28
2.7	Resolution	%	55 minimum
2.8	1F Output	mV p-p	0.5 minimum
2.9	Read Resonant Frequency	MHz	> 3.0
2.10	Crossfeed	%	5 maximum
2.11	Crosstalk	%	500 maximum
2.12	Read ETW (A)	inch	0.003 ± 0.00015
2.13	Write ETW (B)	inch	0.007 ± 0.00015
2.14	Track Pitch (C)	inch	0.1207 ± 0.0004
2.15	Track Centerline Tolerance (D)	inch	0.0005 maximum
2.16	Distance between Gaplines (E)	inch	0.300 ± 0.002

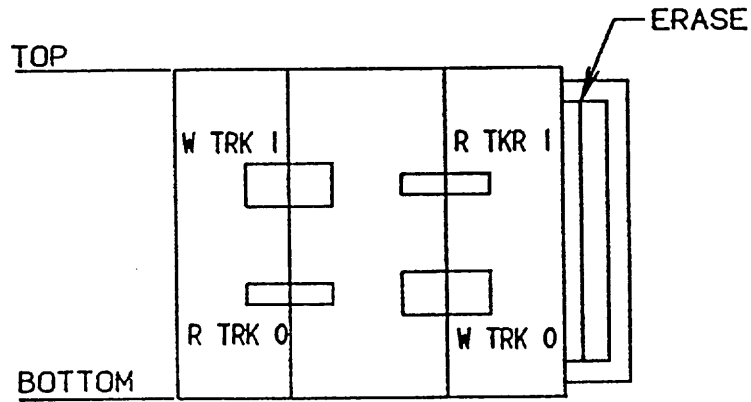
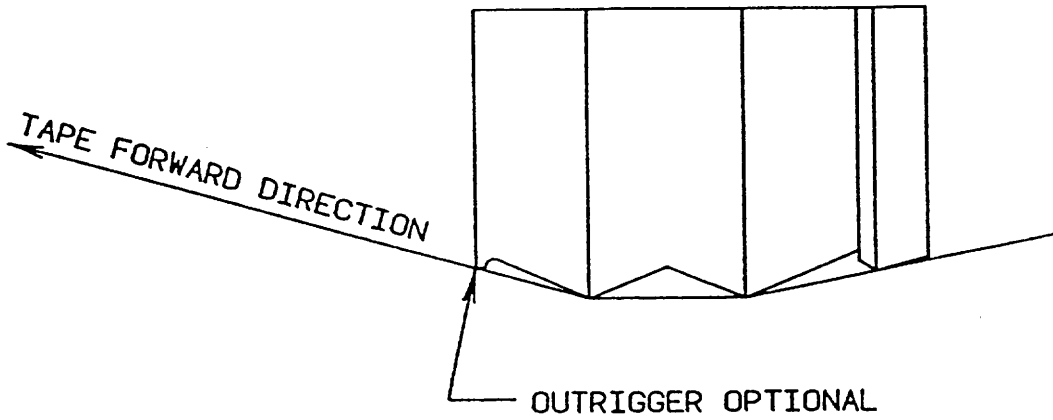
5.0 DEFINITIONS For QIC 3040-MC Heads

- 3.1 The head employs read-while-write data verification, so that the data recorded is read and verified on the same pass as it was recorded.
- 3.2 The recording format for both heads is NRZI, where a ONE is represented by a change of direction of longitudinal magnetization.
- 3.3 Erasure. To erase the tape, overwrite shall be used.
- 3.4 Overwrite. If writing occurs on a previously written tape, each track shall be overwritten so that the previous recording on the track is reduced with at least 24dB.
- 3.5 The peak shift specification in (2.6) is defined as below. The instantaneous spacings between flux transitions shall satisfy the following conditions: In a sequence of flux transitions defined by the encoded pattern 0101001011. (hex 29 data pattern), the maximum displacement of flux transitions shall not exceed the specification from the nominal bit cell averaged over the six transition cells between the reference flux transitions.
- 3.6 A.C. Bias (optional). A high frequency A.C. bias write current with the write signal current superimposed may be used as a recording method. No current values as bias frequency will be set at this time.
- 3.7 Resolution. With the recording method used, a 3:1 ratio in transition densities may occur. The resolution value is determined as the ratio indicated below:

$$\text{Resolution} = \frac{E_o \text{ @ } 1F}{E_o \text{ @ } 1/3F}$$

where $1F=50,800$ FRPI

- 3.8 The read resonant frequency is defined with a 10 pf load.
- 3.9 The write saturation current (I_{sat}) is defined as the current value at the first 95% of the maximum read output (without A.C. bias) at 1F.
- 3.10 The write current (I_w) used in the two heads is defined as 115% of I_{sat} , (without A.C. bias).
- 3.11 Crossfeed is defined as the ratio of the signal through the read coil with the write coil under test energized at 1F and at I_w , to the "read-while-write" output signal at 1F. The measurement is facilitated using a spectrum analyzer set at 100k Hz to 2.0MHz.



READ ETW "A" ± .00015
WRITE ETW "B" ± .00015

