



DEVELOPMENT STANDARD

QIC-134
Revision F
27 Aug 97

MAGNETIC HEAD FOR USE WITH
QIC-5010-DC RECORDING FORMAT

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(See important notices on the following page)

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QIC DEVELOPMENT STANDARDS
REVISION HISTORY
QIC-134

Revision Level	Detail	Revision Date
Rev. C	(1) Added backward compatible performance to include full read and write compliance to 5.0 GBC drive level.	9/1/93
	(2) Tape length changed to 1200 feet from, 925.	9/1/93
	(3) 10 GB storage changed to 13GB	9/1/93
Rev. D	(1) Write ETW changed from 31.5 μ m to 30.5 μ m	12/8/93
	(2) Add W/R-R/W configuration	12/8/93
Rev. E	Added paragraph 6.0, page 11; Caution statement to head cleaning provision.	20 Jun 1996
Rev. F	(1) Remove reference to QIC-3070-MC	27-Aug-97
	(2) Remove option for 4 Bump head	
	(3) Correcting of mechanical data errors	

1.0 GENERAL SPECIFICATIONS

1.1. Type of Head

This specification defines a multi-bump, multi-channel read while-writing with optional erase, thin film/magneto-resistive head for _” data cartridge.

It features one configuration:

- RWR (read write read) which has 3 bumps and 2 outriggers or 3 bumps, 1 outrigger and 1 erase.

Each bump has 4 channels. Three of the 4 channels are for data and servo tracks per the 16GB drive formats (144 data tracks and 24 servo tracks). The fourth channel is for backward write and read compatibility per the following QIC drive formats:

	16GB
Write & Read	QIC-5.0 GBC QIC-2.1 GBC QIC-1350 QIC-1000/2000 QIC-525
Read Only	QIC-150 QIC-120 QIC-24

1.2. **Write Head Structure** – Thin-film inductive elements.

1.3. **Read Head Structure** – Thin-film shielded magneto-resistive elements.

2.0 ELECTRICAL SPECIFICATIONS

2.1. Tape I/D and Speed Tension Matrix

- **13 GB Data Cartridge Drive**
Tape I/D (91-39) = DC 13 GBC (1200' length)

Speed (IPS)	Tension (oz)
45	1.0 – 3.25
90	1.2 – 3.50
25 to 120	1.4 – 3.75

2.2. Dynamic Performance, Unequalized – Write Head (reference square wave recording)

		5 Bump RWR
2.2.1.	Saturation current, I_{sat} (0 to peak 95% point) (ma)	10-35
2.2.2.	Maximum current, I_{max} $I_{max} = 1.15 \times I_{sat}$ (ma)	40.25 max.
2.2.3.	Overwrite of 12,700 FCI signal by a 50,800 FCI signal (residual 12,700 FCI/12,700 output at I_w . I_w defined as $1.15 \times 95\% I_{sat}$. (dB)	-26 max.
2.2.4.	Channel-to-channel spread of I_{sat} (per gap line) (%)	$\pm 5\%$

2.3. Dynamic Performance, Unequalized – Read Head (Reference square wave recording)

		5 Bump RWR
2.3.1.	Output at 50,800 FCI @ I_w (μV)	700 ref.
2.3.2.	Sense Current (ma)	10 nom.
2.3.3.	Channel-to channel spread per gap line (%)	± 5
2.3.4.	Resolution for 50,800/12,700 @ I_w (%)	30 ± 10
2.3.5.	2 nd Harmonic distortion @ f (dB)	-25 max.
2.3.6.	Crossfeed (filter set at 3 dB points of 40 KHz & 6.0 MHz). Worst case for this parameter is achieved when channels 1 & 3 are writing and channel 2 is reading. This specification calls for this test. (dB)	-26 max.

2.3.7. Self erasure (demagnetization at 5 th forward pass)	(%)	10 max.
2.3.8. Stray field susceptibility. This defines the maximum allowable applied magnetic field while the head is in operation.	(Oe)	5

3.0 MECHANICAL SPECIFICATIONS

3.1. Dimensions

3.1.1 Gaps (Mechanical) Reference		5 Bump RWR
3.1.1.1 Read	(μm) ($\mu\text{''}$)	0.50 ± 0.05 (20 ref.)
3.1.1.2 Write	(μm) ($\mu\text{''}$)	1.91 ± 0.10 (75 ref.)
3.1.2 Physical Element Width, Reference		
3.1.2.1 QIC-16GB Read (6 places)	(μm) (mils)	19.0 ± 1.0 (0.75 ref.)
3.1.2.2 Downward Compatible Read (2 places)	(μm) (mils)	76.2 ± 3.8 (3.00 ref.)
3.1.2.3 QIC-16GB Write (3 places)	(μm) (mils)	30.5 ± 2.0 (1.2 ref.)
3.1.2.4 Downward Compatible Write (1 place)	(μm) (mils)	177.8 ± 3.8 (7.00 ref.)
3.1.3 Gap-to-Gap (2 places)	(mm) (mils)	1.524 ± 0.075 (60 ref.)
3.1.4. Read Channel to Write Channel – Centerline Mismatch	(μm) (mils)	2.54 max. (0.1 max. ref)
3.1.5. QIC – 16GB Pitch Ch. 1 to Ch. 2	(μm) (mils)	408 ± 1 (16.0 ref.)
3.1.6. QIC-16GB Pitch Ch. 2 to Ch. 3	(μm) (mils)	816 ± 1 (32.0 ref.)
3.1.7. QIC-16GB Pitch Ch. 1 to Ch. 3	(μm) (mils)	1224 ± 1 (48.1 ref.)
3.1.8. Downward Compatible (Ch. 4) Position, Ref. Ch. 2	(μm) (mils)	408 ± 1 (16.0 ref.)

3.2 Track and Head Reference Outlines – See figures 1 through 2

4.0 STATIC SPECIFICATIONS

		5 Bump RWR
4.1	Write D.C. resistance (all tracks) (ohms)	10 ± 5
4.2	Read D.C. resistance (16GB tracks) (ohms)	50 ± 14
4.3	Read D.C. resistance (downward) (ohms)	84 ± 14
4.4	Insulation resistance (read & write, tested at 1.0 V.D.C) (Mohms)	10 min.
4.5	Write Impedance (reference dimensions only)	
	16GB coils @ 1.59 MHz (ohms)	9.5
	(nHys)	300
	16GB coils @ 15.9 MHz (ohms)	9.6
	(nHys)	290
	Downward coil @ 1.59 MHz (ohms)	10.6
	(nHys)	470
	Downward coil @ 1.59 MHz (ohms)	10.8
	(nHys)	450
4.6	Write resonant frequency (both coils) (MHz)	70 min.

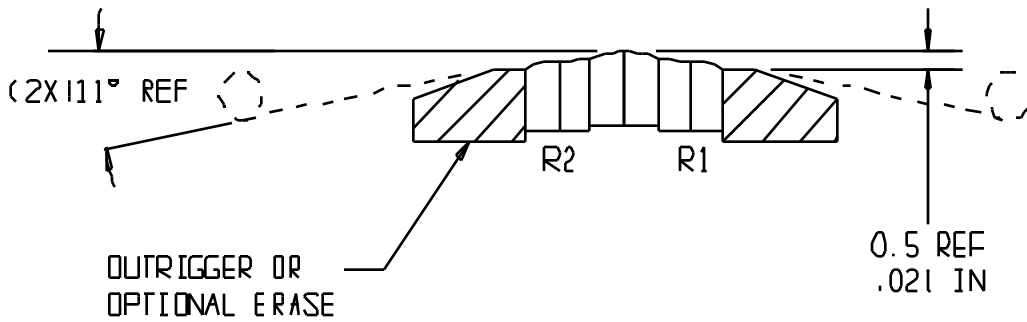
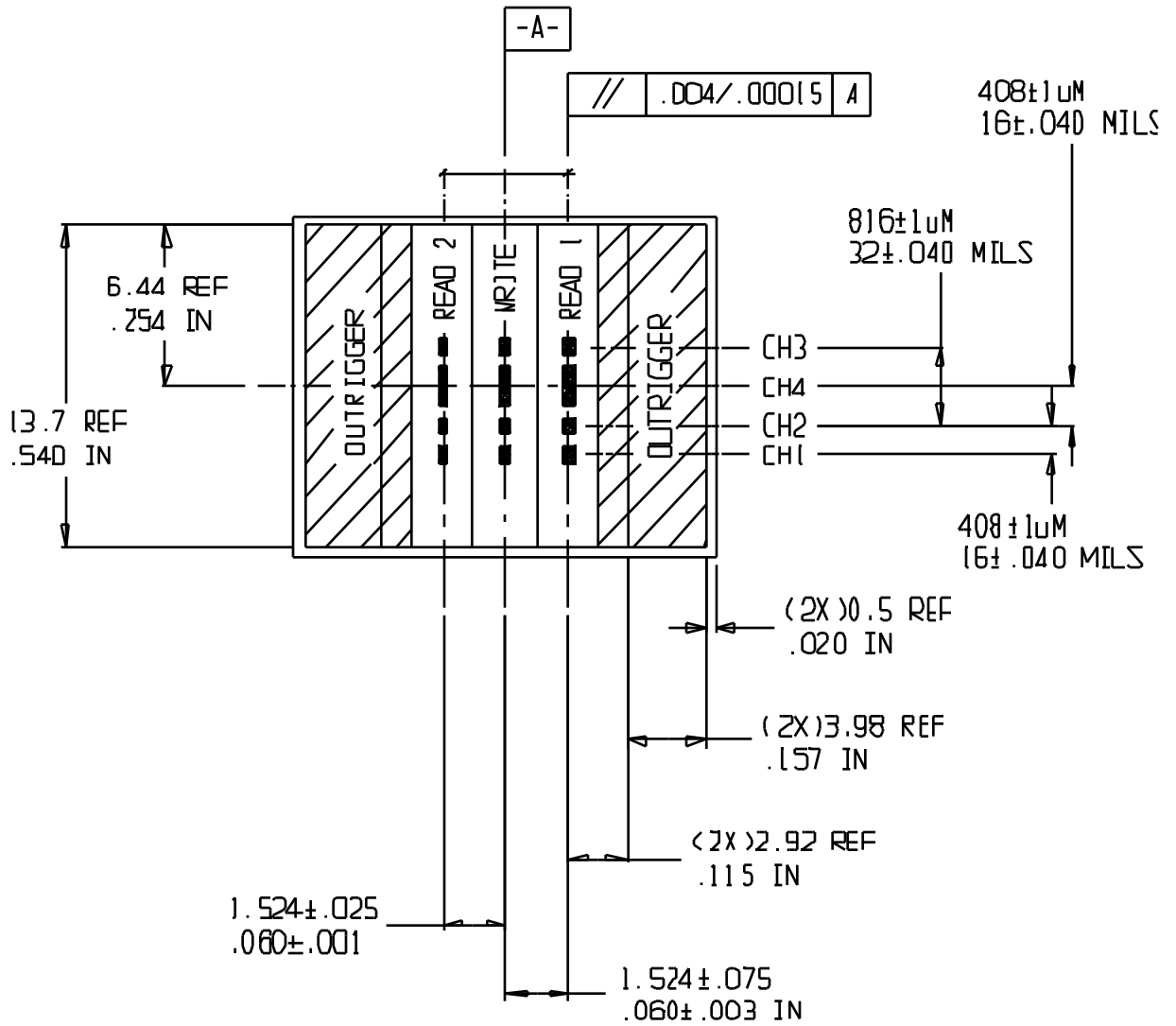
5.0 A.C. ERASE HEAD SPECIFICATION

5.1	Mechanical Requirements		5 Bump RWR
5.1.1.	Erase track width	(mm) (inches)	7.6 min. 0.300
5.1.2.	Erase gap length	(μ m) (μ "	8.64 ref. 340 ref.
5.1.3.	Erase core material		Manganese zinc ferrite
5.2	Electrical Performance		AC
5.2.1.	Erase mode		46 ref.
5.2.2.	AC Impedance (1/2 coil @ 9 MHz)	(ohms)	Center tapped
5.2.3.	Coil Configuration		1.0
5.2.4.	Inductance	(μ Hys)	350 nominal
5.2.5.	Current (both legs)	(mA)	8.5 ref.
5.2.6.	Operation frequency	(MHz)	-30 max.
5.2.7.	Erasure Residual 12.7 KFCI signal written at 1w and 120 ips	(dB)	

6.0 HEAD CLEANING

CAUTION: The use of any head cleaning system, whether employing wet, dry, or scrubbing actions, must be extremely carefully tested and evaluated for efficacy and validated not to cause damage to the tape head structure in ways outlined below, but not limited to those areas described in the following section.

- 6.1** The following solvent(s) may be used to clean the head without:
- (a) causing damage to its structure
 - (b) permitting head fabrication glues and epoxy products to wick to the head to tape interface;
 - (c) causing damage to the media in the event that small amounts do not evaporate immediately;
 - 1. Reagent grade anhydrous isopropyl alcohol
- 6.2** Head cleaning cartridge methods must:
- (a) limit the solvent applied to a quantity sufficient to clean the head without leaving or redepositing debris;
 - (b) not permit solvent to seep into the head surface bond lines and contour airbleed slots; and
 - (c) not contribute to electrostatic discharge problems which damage the head.



ETW Table

Read Write Read
 Figure 2

		5 Bump RWR
QIC – 16 Read	(μm) (mils)	19.0 \pm 1.0 .748 \pm .040
QIC – 16 Write	(μm) (mils)	30.5 \pm 2.0 1.20 \pm .080
QIC-Downward Compatible Read	(μm) (mils)	76.2 \pm 3.8 3.00 \pm .150
QIC-Downward Compatible Write	(μm) (mils)	177.7 \pm 3.8 7.00 \pm .150

ETW Table