



Wideband Analog Tape Recorders/Reproducers: Meeting Customers Needs

Brian Corder

Metrum-Datatape Incorporated

605 E. Huntington Drive Monrovia, CA 91016

Ph: +1-626-358-9427, Fax: +1-626-930-9479

Email: bcorder@metrum-datatape.com

www.Metrum-Datatape.com

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THIC Inc.



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Metrum-Datatape throughout history has been a force in developing and providing Analog Tape Recorders/Reproducers

- 1990 -- 6 MHz Analog DTR-6
- 1992 -- Time Division Multiplexing is Introduced
- 1995 -- 8 MHz Analog DTR-8
- 1996 -- Enhanced 8 MHz Analog DTR-8E
- 1999 -- 16 MHz Analog DTR-16
- 2001 -- Dual Time Division Multiplexer, TDM-D8, is Introduced
- 2001 -- 25 MHz Analog DTR-25



Analog Product Strategy and Roadmap

- **Provide a cost effective solution for recording of wideband data way beyond the capability of IRIG class Instrumentation recorders**
 - **SVHS and other commercial video recording technologies made this possible**
 - **Ride the performance curve of commercial technologies VHS/SVHS/D3/D5**
- **Provide a cost effective solution for replacing large numbers of longitudinal recorders by employing multi channel Time Division Multiplexers as a front end to the DTR Product family**
 - **TDM-6**
 - **TDM-8**
 - **TDM-8E**
 - **TDM-D8**
 - **TDM-12**



- **Customers had definitive requirements for Analog Tape Recorders**
- **S-VHS Format provides low-cost commercially available media**
- **Analog Bandwidth compares favorably with Digital Data Rates**
- **Analog recorders provide appealing Size and Weight**
- **Easily transportable**
- **Proven history of reliability**
- **Extremely low life cycle cost**



■ Analog Recorder with SVHS ST-120 Cassette

<u>Bandwidth</u>	<u>Record Time</u>	<u>Cost/Hour</u>
6 MHz	40 min.	\$15
8 MHz (SP)	40 min.	\$15
8 MHz (LP)	80 min.	\$8
16 MHz	20 min.	\$30
14/28 Channel longitudinal	15 minutes	\$600



■ Analog Bandwidth vs. Digital Data Rates

<u>Analog</u>	<u>Digital</u>	<u>Digital Cost</u>
6 MHz	120 Mbps	\$100K
8 MHz	160 Mbps	\$175K
16 MHz	320 Mbps	\$300K
25 MHz	500 Mbps	\$430K
50 MHz	1000 Mbps	N/A
100 MHz	2000 Mbps	N/A



■ Recorder Comparisons: Size and Weight

Recorder Type	Volume (ft ³)	Weight (lb)
Analog	< 1.0	< 25
Digital	up to 4.5	170
Longitudinal	4.6 +	170 +



- **Over 1500 DTR recorders have been delivered to date**
- **The DTR has become *de-facto* standard in the wideband Sigint community**
- **Time Division Multiplexing has greatly enhanced ISR recording effectiveness**
- **Metrum-Datatape has continued to push the envelope in Wideband Analog Tape Recorders with the DTR-25**



DTR-16 16 MHz Analog Tape Recorder/Reproducer

- **Bandwidth:** DC to 16 MHz, Single Channel
DC to 8 MHz, Dual Channel
- **Auxiliary Channels:** 2 linear phase @ 100 Hz to 20 kHz
- **Media:** SVHS ST-120 cassettes
- **Record Times:** 20 minutes with SVHS ST-120
- **Input/Output Impedance:** 50/75 ohms, selectable
- **Volume:** 1029 in³ (0.6 ft³)
- **Weight:** < 25 pounds (without cassette)
- **Power:** 90-264V AC; 47-400 Hz; < 100 W
- **Remote Interfaces:** IEEE-488; Serial RS-422 or RS-232;
Parallel TTL



Analog PRESENT

■ Using DTR-16 with TDM-D8 Mux/Demux



DTR-16



TDM-D8

Mux Group A		Mux Group B		Total # channels
# chan	BW (MHz)	# chan	BW (MHz)	
1	16 (Bypass)	-	-	1
1	8 (Bypass)	1	8 (Bypass)	2
2	4	2	4	4
4	2	2	4	6
4	2	4	2	8
8	1	-	-	8

■ Independent control of Group A and Group B

- Great flexibility in number of channels and bandwidths
- Record different bandwidth signals on same tape
- Have 2 Aux channels for IRIG and Voice



DTR-25 **25 MHz Analog Tape** **Recorder/Reproducer**

- **Bandwidth:** DC to 25 MHz, Single Channel
DC to 12.5 MHz, Dual Channel
- **Auxiliary Channels:** 2 linear phase @ 100 Hz to 12 kHz
- **Media:** D3 or D5: Small, Medium, Large
- **Record Times:** 8 - 165 minutes depending on cassette
- **Input/Output Impedance:** 50/75 ohms, selectable
- **Size:** 7"H x 17"W x 22"D (23.2" overall)
- **Weight:** < 55 pounds (without cassette)
- **Power:** 90-264V AC; 47-400 Hz; < 250 W
- **Remote Interfaces:** IEEE-488; Serial RS-422 or RS-232;
Parallel TTL



- **Analog Tape is still the most cost effective solution for the collection and storage of wide bandwidth data**
- **The DTR-25 Read-While-Write provides a capability previously only available in longitudinal recording systems**
- **50 MHz is readily achievable with D5 technology**
- **Incorporation of next generation TDM with DTR-50 will provide twelve 2 MHz channels**
- **Resistance to Change**



- **Today's market is Price Driven**
- **Foreign Markets -- Extremely Cost Driven**
- **Analog Recorders Are Lower in Cost**
- **50 MHz is readily achievable with D5 technology**
- **Excellent for Field Use and Confined Space Requirements: Sub-Surface, Small Planes**