CONTENTS

		Page
PRE	EFACE	iii
SUMMARY		1
1.	INTRODUCTION	1
2.	THE COMPLETE DATA ACQUISITION SYSTEM	2
3.	THE INTERFACE BETWEEN THE DATA SOURCE AND THE SYSTEM INPUT 3.1 System Input Conditions 3.2 Steady-State Errors in the Data Source/System Interface 3.3 Errors due to AC Common-Mode Signals	4 4 4 5
4.	AMPLIFIERS	6
5.	MULTIPLEXERS 5.1 Switch Elements 5.2 Multiplexing Configurations 5.3 Multiplexer Control	7 7 8 8
6.	FILTERS AND ALIASING ERRORS 6.1 Aliasing Errors 6.2 Types of Filter 6.3 Adaptive Sampling	9 9 11 11
7.	ANALOGUE/DIGITAL CONVERTERS 7.1 Characteristics 7.2 Conversion Techniques and Equipment	12 12 13
8.	THE MAGNETIC RECORDING PROCESS 8.1 General Discussion 8.2 Analogue or Linear Recording 8.3 Digital Recording	14 14 14 16
9.	ANALOGUE RECORDING METHODS 9.1 Direct Recording 9.2 Frequency Modulation Recording 9.3 Other Analogue Recording Methods	17 17 18 20
10.	DIGITAL RECORDING METHODS 10.1 Digital Words and their Recording Formats 10.2 Bit Clocking; Word and Frame Synchronisation 10.3 Encoding Methods in the Write Operation 10.4 Decoding Methods in the Read Operation	21 21 22 22 22 24
11.	ERROR-PRODUCING EFFECTS IN THE MAGNETIC RECORDING PROCESS 11.1 Tape Speed Variation – Flutter 11.2 Tape Motion Irregularity – Time Displacement Error 11.3 Noise, Cross-Talk and Drop-Outs	25 25 26 27
12.	DATA PACKING DENSITY 12.1 General — Tape Thickness 12.2 Lineal Packing Density — Analogue Recording 12.3 Lineal Packing Density — Digital Recording 12.4 Track Packing Density — Analogue and Digital Recording 12.5 Lineal Packing Density — Digital Recording in a Parallel Mode 12.6 Non-Saturation Recording of FM and PCM	29 29 29 30 31 31
13.	TAPE TRANSPORTS 13.1 General Description and Environmental Conditions 13.2 Reel-to-Reel Transports (Continuous Tape Motion) 13.3 Other Types of Transports 13.4 Available Transports and their Characteristics	33 33 34 36 38

		Page
14.	WRITE AND READ HEADS	40
	14.1 Ring-Type Laminated Heads	40
	14.2 Ring-Type Ferrite Heads	41
	14.3 Miscellaneous Types of Heads	41
	14.4 Head Wear	42
15.	THE RECORDING MEDIUM	42
	15.1 Particulate Tape	42
	15.2 Homogenous and Thin Film Tapes	43
	15.3 High Temperature Tapes	43
	15.4 Tape Erasure, Cleaning and Storage	44
16.	SPECIFYING A FLIGHT TEST DATA ACQUISITION SYSTEM	44
17.	A GLIMPSE INTO THE FUTURE	46
	17.1 Signal Conditioning	46
	17.2 Magnetic Recording	47
	17.3 Other Recording Methods	47
REFERENCES		48
FIGURES		53

was a second of the second of