## CONTENTS

EUGENE AUGUSTIN LAUSTE Frontispied	e
PAC	
PREFACE	11
CHAPTER I	
HISTORY OF TALKING PICTURES	1
The beginning—The Cinephone—The Vivaphone—Gaumont—Eugene Lauste—Von Madeler—Dormant years—The coming of the valve—The birth of the modern talkie—The boom—Stabilization	
CHAPTER II	
GENERAL IDEAS	21
Sound on film—Sound—Frequency—What we hear—Speech—Limitation of the early talkies—Speed control—Synchronism—The apparatus chain	
CHAPTER III	
FILM AND DISC, AND SILENT PROJECTION	30
Film size—Relative position of picture and sound—Variable density and variable width—Variable density film recording—Variable width film recording—Disc recording—Silent projection—The silent cinematograph projector—The optical system—Motor driving—Use of two projectors	
CHAPTER IV	
	16
Sound projectors—Sound attachment systems, disc—Sound film attachments—Film and disc attachments—The universal base projector—Special head drives—Turntables and their drives—Electric pick-ups or reproducers—Pick-up arms—Sound unit—Exciting lamp—Lens assembly—Sound gate mechanism—Driving the Movietone sprocket—The photo-electric cell—Position of the pick-up amplifier—Driving the sound projector—Sound projectors in general and the Motiograph	

## CHAPTER V

CHAPTER V	
AMPLIFICATION, POWER AND STAGE EQUIPMENT	PAGE 92
System schematics—Principles of amplification and sound reproduction—Impedance matching—Amplifiers—The fader and volume control—Attenuators—Speaker control panels—The monitoring speaker—The power system—Conversion plant—Batteries and charging—Power control gear—R.C.A. power	
system—Theatre loud speakers—The use of horns—The Western Electric speaker unit—The "Roxy" horn—Directional baffles— —The Uni-directional bowl speaker—The sound screen—The non-synchronous reproducer set—Portable sound systems	
CHAPTER VI	
THEATRE ACOUSTICS	135
The old theatres—Reverberation—Reverberation and sound absorption—Calculation of time of reverberation—Reverberation and frequency—Reflection and interference—Echo—Resonance—Distribution—Surveying theatres—Planning—Awkward theatres—Other theatre defects—Correcting faults—Building new sound theatres	
new Bodila theteres	
CHAPTER VII	
INSTALLATION	151
The back stage run—Horns and screen—Felting—The Movietone mask—Laying out the operating box—Wiring difficulties—Equipment positions—The battery room—Installing generators—The Non Sync—Early tests—Change-over night—Testing and matching machines—Testing valves—Pointing the speakers approximately—Rear projection work—Resetting horns to sound—Troublesome cinemas—Phasing of speakers—Scratch—Surface or ground noise—Machine noise	
CHADWIND WITH	
CHAPTER VIII	
IN THE OPERATING BOX—PREPARING THE PROGRAMME.	177
Preparing the programme—Starting up the equipment—Testing out projectors—Focusing the exciting lamp—Tracking the film — Starting sound-on-dise—Change-overs—Volume control—Losing synchronism—Needles and needle wear—Splicing sound film—Troubles and service—Sound troubles—Service inspections	

	•
X	1

## CONTENTS

## CHAPTER IX

RECORDING ON DISC	194
Characteristics of the modern record—The talkie disc—Waxes and wax shaving—Disc recording machines—The recorder—Recorder response—Interlocking and speed control—Rotating the turntable—Operating the recording machine—Making a test cut—Recording—Playing back—Turning out the finished record	
CHAPTER X	
RECORDING ON FILM	215
Recording with the light valve—Details of the light valve—Light valve recording machine—The fogger—Motor drive—Adjusting and tuning—Tuning the light valve—Playing back—The sound track and its treatment—Setting the recording lamp—Developing—Variable density recording by glowlamp—Recording with the Oscillograph—The R.C.A. recording machine—The Vibrator—Adjusting the recorder lamp—Treatment of variable width sound track—Printing the sound film—Coloured sound films—Cameras for sound recording—The condenser microphone or transmitter	
CHAPTER XI	
THE STUDIO	252
Studio technique—Lighting troubles—Studio acoustics—Microphone placement—Multiple shots—Synchronizing camera and microphone, the Clapstick—Sound lay-out of a studio—Monitoring—Balancing sound levels—Dubbing or re-recording—Editing the sound picture—Location recording—The Beam Microphone—Distance recording—Stock sounds faking—Recording the sound newsreel, talkie journalism—Synchronized pictures—Synchronizing in the studio—Acting technique of sound pictures	
CHAPTER XII	
CONCLUSION	290
News by sound picture—The talkie as an educator—On the high seas—Sound pictures in hospitals—Talkies at home—Stage and screen—Coloured pictures—Stereoscopic pictures—The screen of the future—The talkie, television, and theatre of the future	
INDEX	303