



# Contents

---

<i>Introduction</i> . . . . .	1
<i>I Mapping the Route</i> . . . . .	5
<i>II How a Film Starts</i> . . . . .	14
CATEGORIES OF STYLE IN THE FILM OF IDEAS	21
WHERE THE FILM COMES FROM	25
THE UNIT	25
THE DIRECTOR AND UNIT MANAGER	28
THE CAMERA AND ITS CREW	32
GRIPS AND GAFFERS	34
THE SOUND CAMERA AND ITS CREW	34
THE SCRIPT GIRL	35
DUTIES OF THE UNIT	35
FILM AND ACTUALITY	36
<i>III The Camera</i> . . . . .	39
ADAPTING THE CAMERA TO ACTUALITY	40
ADAPTING ACTUALITY TO THE CAMERA	43
HOW THE CAMERA WORKS	46
DRIVE AND SPEED RANGE	47
FILM MAGAZINES	50
FOCUSING AND VIEWFINDING	51
LENSES	54
THE ZOOM LENS	62
LENS TURRETS AND ACCESSORIES	64
INTERMITTENT MOVEMENT	66

THE CHOICE OF A CAMERA	71
CHARACTERISTICS OF LEADING MAKES	72
CAMERA FAULTS	75
ACCESSORIES TO THE CAMERA	77
BLIMPS	77
CAMERA MOUNTINGS	77
TROPIC HEAT AND ARCTIC COLD	80
THE PROBLEM OF EXPOSURE	82
FILM SPEEDS AND EXPOSURE INDEXES	87
 IV <i>The Cutting Room</i> . . . . .	90
THE ARITHMETIC OF FILM	91
THE CUTTER'S TOOLS	94
THE MOVIOLA	96
THE SPLICER	98
BITS AND PIECES	100
FILING PROCEDURE	101
FILM ON FIRE	103
THE PSYCHOLOGY OF CUTTING	104
SYNC	107
THE CUTTING UNIT	111
THE FILM TAKES SHAPE	112
 V <i>The Library: Indexing Time and Space</i> . . . . .	114
STORING FILM	115
THE FILM ENCYCLOPEDIA	115
 VI <i>Synthesizing Space and Time</i> . . . . .	120
ANIMATING THE INANIMATE	122
THE CAMERA IN ANIMATION	124
THE CATEGORIES OF ANIMATION	128
SHOOTING AT SECONDHAND	146
 VII <i>The Irreplaceable Negative</i> . . . . .	152
 VIII <i>The Laboratory: Studio Grand Central</i> . . . . .	160
THE IMAGE APPEARS	163
WHAT GOES INTO A DEVELOPER AND WHY	165
WHAT GOES ON IN A DEVELOPING MACHINE AND WHY	167

CONTROLLING THE IMAGE	171
SENSITOMETRY AND THE FILM CHARACTERISTIC	174
WHY EXPOSURES AND DENSITIES ARE MEASURED LOGARITHMICALLY	177
THE RELATION BETWEEN CONTRAST AND THE CHARACTERISTIC CURVE	178
PRACTICAL SENSITOMETRY	183
PRACTICE AND THEORY DIVERGE	185
THE EFFECTS OF OVER- AND UNDER-EXPOSURE	186
LATITUDE	187
SPEED	188
NEGATIVES AND POSITIVES	189
THE PRINT COMES OFF	194
THE CONTINUOUS-CONTACT PRINTER	195
THE CONTINUOUS-OPTICAL PRINTER	195
THE STEP-CONTACT PRINTER	196
THE STEP-OPTICAL PRINTER	196
MULTIPLYING THE ORIGINAL NEGATIVE	196
SNOWBALLING ERRORS	197
IRONING OUT BRIGHTNESS CHANGES	198
ROUTING THE TRAFFIC	200

IX <i>Production Techniques: Color and 16 mm.</i>	203
WHAT IS COLOR?	204
FILTERS	205
ADDITIVE COLOR PROCESSES	207
SUBTRACTIVE COLOR PROCESSES	208
PACKING UP THE COLOR	211
THE MONOPACK OR INTEGRAL TRIPACK	211
BIPACKS	215
TRIPACKS	216
RELEASE PRINTING	216
DYE TONING	217
MONOPACK PRINTING	217
THE TRANSFER PROCESS (IMBIBITION PRINTING)	219
BLOW-UP	220

MASKING	220
SOUND REPRODUCTION	221
CAMERA MODIFICATIONS ENTAILED BY COLOR	223
LIGHTING FOR COLOR	225
LEVEL AND CONTRAST OF LIGHT	230
LATER STAGES OF COLOR PRODUCTION	231
CHARACTERISTICS OF 16 MM. PRODUCTION	232
16 MM. FILM: REVERSAL	235
THE 16 MM. CAMERA	239
EDITING 16 MM. FILM	240
MATCHING 16 MM. ORIGINALS	242
16 MM. SPLICING	243
STORAGE OF 16 MM. FILM	244
DUPLICATION OF 16 MM. FILM	246
16 MM. SOUND RECORDING	247
16 MM. RELEASE PRINTING	254
BLACK-AND-WHITE RELEASE	254
COLOR RELEASE	255
EMULSION POSITION	256
GREEN FILM	257
16 MM. PROJECTION	258
MECHANICAL AND ELECTRICAL CON-	
STRUCTION	259
PICTURE PROJECTION	260
SOUND PROJECTION	264
THE SCREEN	267
SIMPLE PROJECTOR TESTS	268
PRINTS AND PROJECTORS	270
SUMMARY OF 16 MM. PRODUCTION CHAR-	
ACTERISTICS	271
FILM WIDTHS: A SUMMARY	272
 X <i>Sound: Getting It onto Film</i> . . . . .	275
WHAT IS SOUND?	276
SOUND—IMAGE—SOUND	279
TYPES OF SOUND TRACK	282
THE MODULATOR	283
THE AMPLIFIER	288
NOISE REDUCTION	288

DISTORTION	293
FREQUENCY DISTORTION AND MODIFICATION	293
AMPLITUDE DISTORTION	295
INTERMODULATION DISTORTION	296
CROSS MODULATION	299
DYNAMIC DISTORTION	299
SCALE DISTORTION	300
DISTORTION AT WORK	300
METHODS OF IMPROVING THE SOUND TRACK	304
CONTROL TRACKS	306
STEREOSOUND	307
VARIABLE-AREA AND VARIABLE-DENSITY RECORDING	309
MAGNETIC RECORDING	312
PRACTICAL APPLICATION	316
BASIC PROBLEMS OF RECORDING	319

## XI *Sound: Getting It onto the Screen* . . . . . 323

BREAKING UP THE WORLD OF SOUND	323
SELECTING THE SOUNDS THAT ARE WANTED	324
PUTTING THE SOUNDS TOGETHER	325
NOISES OFF	328
FILM MUSIC	328
MECHANICS OF SOUND CUTTING	329
THE FINAL SOUND TRACK	331
THE MIXER	332
THE MIXING MACHINE	333

## XII *Some Studio Techniques* . . . . . 336

LIGHTING	337
TECHNIQUES AND SOURCES	339
INCANDESCENT LIGHTING	341
ARC LIGHTING	344
STUDIO ACCESSORIES	345
PROCESS PROJECTION	348
PRESORING AND PLAYBACK	349
DUBBING	353

XIII	<i>Journey's End</i> . . . . .	358
XIV	<i>Things to Come</i> . . . . .	364
	FILM AND TELEVISION	365
	ADDING A THIRD DIMENSION	374
	STEREOGRAPHIC ART	379
	THE LIBERATION OF SOUND	381
	MUSIC WITHOUT INSTRUMENTS	384
	<i>Epilogue</i> . . . . .	388
	<i>Glossary</i> . . . . .	393
	<i>Booklist</i> . . . . .	485
	<i>Index of Films</i> . . . . .	503
	<i>General Index</i> . . . . .	506