

DOCUMENTS ON 16mm MICROFILM
EQUIPMENT AND MATERIALS FOR
PRODUCTION, INSPECTION, AND REPRODUCTION



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microfilm of documents in the Bell System. The list also includes some of the equipment accessories that are available. In selecting an equipment item, consideration should be given to the availability of authorized dealer service. This section also includes a list of equipment that, while no longer manufactured, is considered suitable for use in the Bell System microfilm program.

1.02 Detailed reasons for reissue are found at the end of this section. Since the reissue covers a general revision, the arrows ordinarily used to indicate changes have been omitted. Shaded areas in tables indicate changes.

1.03 To ensure that the ordering information specified in this section is still in good standing, the appropriate WE service center should be contacted through local purchasing service departments before orders are placed.

1.04 Information in regard to supplies required in the operation of equipment, such as enlarger-printers and reader-printers, is covered in the manufacturer's instructions.

1. GENERAL
1.01 This section covers a list of equipment and materials considered suitable for the production, inspection, and reproduction of 16mm

1.05 The requirements for the special instructions on the use of equipment and materials listed in this section are covered in Sections 006-210-100, 006-210-500, 006-215-100, and 006-215-500.

NOTICE
Not for use or disclosure outside the
Bell System except under written agreement

SECTION 006-220-100

2. CAMERAS (Rotary)(Refer to Section 006-120-100, for planetary camera information.)

		RECORDAK RELIANT 700 MODEL RW	BELL AND HOWELL DIRECTOR II RECORDER
Approximate Dimensions (inches)	Width	25-1/2	20-1/2
	Depth	29-1/2	23-1/2
	Height	16	12-1/2
Approximate Weight (pounds)		153	98
Power Requirements	Volts	117	115
	Cycles	50/60 Hz	60 Hz
	Amperes	4	7
Reduction		24X	24X
Film Capacity (feet)		100	100
Maximum Document Size (inches)	Width	12 (see Note 1)	12 (see Note 2)
	Length	Any Length	Any Length
Film Methods Available	Simplex	Yes	Yes
	Duo	No (see Note 3)	No (see Note 4)
	Duplex	No (see Note 3)	No (see Note 4)
Major Accessories Available	Constant Voltage Transformer	No	No
	Illumination Control	5-Position Pushbuttons	Rotary Switch
	Other Reductions Available	32X 40X 45X	34X 44X
	Automatic Feeder	Yes	Yes
	Manual Feeder	Yes	Yes
Ordering Information (see 1.03)		See Bell System Evaluation Standards	
		(BSES) Item 3453	(BSES) Item 3456

Notes

1. Maximum photographic field 11-1/4 inches at 24X.
2. Maximum photographic field 11-3/4 inches at 24X.
3. Duo and Duplex methods are applicable at 32X, 40X, and 45X reductions only.
4. Duo and Duplex methods are applicable at 34X and 44X reductions only.

3. DENSITOMETERS

		QUANTALOG TRANSMISSION DENSITOMETER (MACBETH INSTRUMENT CORP)	PHOTOVOLT TRANSMISSION DENSITOMETER CAT. NO. 5312 (PHOTOVOLT CORP)	DENSICHRON 3835A TRANSMISSION DENSITOMETER (WELCH SCIENTIFIC CO)
		TD-102		
Will Measure		Silver and Diaz Film	Silver Film	Silver Film
Power Requirements	Volts	115/120	115/120	115/120
	Cycles	60 Hz	60 Hz	60 Hz
	Amperes	4	2	1
Accessories (see Note 1)		*60 volt- ampere voltage regulator	*No. 5262 Filter	
Ordering Information (see 1.03)		See BSES Item 3403-2 (see Note 2)	See BSES Item 3403-3 (see Note 2)	See BSES Item 3403-4 (see Notes 2 and 3)

Notes

1. Accessories marked with an asterisk (*) are required for Bell System applications.
2. Order should specify that densitometers be calibrated for diffuse visual transmission density to a Kodak No. 3 Calibrated Photographic Step Tablet with a 1mm aperture in place.
3. Orders should specify Model 3835A Densitometer with a linear scale and Model 3834H aperture.

4. FILES

- 4.01 The following file facility is typical. Other files that are equivalent are also satisfactory. For files associated with Microstrip reader application, refer to 12. READERS, Note 1.

		STEELCASE CORP CAT. NO. 1845L (see Note 1)
Number of Drawers		10
Approximate Capacity (16mm reels or magazines)		750
Approximate Dimensions (inches)	Width	14-7/8
	Height	58-5/8
	Depth	28
Ordering Information (see 1.03)		See BSES Item 3443

Note

1. Equipped with ten triple-compartment drawers for 4x4x1-inch microfilm storage boxes.

5. FILMS

	SILVER						DIAZO
	BELL AND HOWELL TYPE 1G (see Notes 1 and 2)	RECORDAK FINE GRAIN TYPE 7456 (see Note 2)	RECORDAK AHU TYPE 7452 (FORMERLY SD-136)	RECORDAK AHU TYPE 7460	BELL AND HOWELL TYPE 1E (see Notes 1 and 2)	BELL AND HOWELL TYPE 1K/400	KODAK 2950 KODAK 3950 BRUNING 91-1541 SCOTT P4-217 GAF 2610 PH
Use	Rotary Cameras		(see Note 3)	(see Note 3)	Planetary Cameras		Duplicate Microfilm
Shelf Life	Expiration date on box						
Storage	Store in cool, dry place						(see Note 4)
Ordering Information (see 1.03)	See BSES 3400 (see Note 5)						Purchase locally

Notes

1. This film is not recommended for processing in medium-production processors.
2. This film is subject to latent density loss (latent image fade). The rate of loss is rapid at first but decreases to a rate that is negligible. To ensure uniform transmission density of processed microfilm, a standard waiting period of at least 3 hours should be observed between the last exposure and the processing of the reel of film.
3. Recordak (AHU) Type 7452 and Type 7460 film can be used on planetary cameras or the Recordak Reliant 700 rotary camera.
4. Store in a cool (60° to 75° F) dry place away from ammonia and ammonia fumes. Film should be kept in original containers until ready to use.
5. Orders should specify processing if desired.

6. LIGHT BOX AND REWIND UNITS

6.01 The Micro-Scan Systems Model 1 film inspector, or equivalent (see Note).
Ordering Information (see 1.03).

Note: A light box can also be constructed locally using fluorescent lamps, frosted glass (or translucent white plastic), and a pair of rewinds. The rewinds are obtainable from the Ozalid Division of the General Aniline and Film Corp, Johnson City, New York, by ordering part No. 750623 and 750624 and specifying 16mm rewinds, or they can be obtained locally.

7. MEASURING MAGNIFIERS

7.01 Measuring magnifier with an inch scale in a case, Catalog No. 81-34-35-37 made by Bausch and Lomb Optical Co, or equivalent.
Ordering Information (see 1.03): See BSES Item 3403-6.

8. MICROSCOPES

8.01 Bausch and Lomb Optical Co, STA-23 Catalog No. 31-21-28-23, microscope equipped with a single nosepiece, 6X achromatic objective lens, 10X high eyepoint Huygenian eyepiece, and Optilume integral illuminator or equivalent. *Ordering Information* (see 1.03): See BSES Item 3403-5.

9. READER-PRINTERS

		3M 400B READER-PRINTER (see Note 1)	3M 400M READER-PRINTER (see Note 1)	3M 400C READER-PRINTER (see Notes 1 and 2)
Accommodates		16mm and 35mm Reel Microfilm, Microfilm Cards, and Microfiche		Cartridges
Screen Size (inches)		10 x 11-1/2	10 x 11-1/2	10 x 11-1/2
Magnification		21X	21X	21X
Approximate Dimensions (inches)	Width	17-1/2	17-1/2	17-1/2
	Height	28-1/2	28-1/2	28-1/2
	Depth	22-3/4	22-3/4	22-3/4
Approximate Weight (pounds)		120	120	120
Power Requirements	Volts	110	110	110
	Cycles	60 Hz	60 Hz	60 Hz
	Amperes	10	10	10
Image Control	Focus	Adjustable	Adjustable	Adjustable
	Image- Rotation	360 degrees	360 degrees	360 degrees
	Scan	Horizontal	Horizontal	Horizontal
Film Transport		Manual	Motorized	Motorized
Accessories		Other lenses are available		
Ordering Information (see 1.03)		See BSES Item 3411-1 (see Notes 3 and 4)	See BSES Item 3411-3 (see Notes 3 and 4)	See BSES Item 3411-2 (see Notes 3 and 4)

Notes

1. The paper print produced by this equipment is electroconductive and a warning note such as the following should be stamped in red on the front of each print in any open space where it will be noticeable to users.

CAUTION
ELECTROCONDUCTIVE PAPER
AVOID CONTACT
WITH LIVE CIRCUITS

2. The 400C reader-printer will accept 3M cartridges only.
3. Orders for print paper for use with these reader-printers should specify 3M Microfilm Copy Paper Type 769.
4. Magnification of 21X should be specified in the order.

10. PROCESSORS

10.01 *Medium-Production Processors (see Notes 1 and 2)*

		REMINGTON RAND CORP UNIPRO MARK II MICROFILM PROCESSOR CATALOG NO. F202.1 (See Note 3)	RECORDAK PROSTAR FILM PROCESSOR MODEL DVR (See Notes 3 and 4)
Approximate Dimensions (inches) (all covers and doors in place)	Width	55	25
	Depth	14	12-1/2
	Height	51	28-1/2
Approximate Weight (pounds) (without solutions)		168	90
Power Requirements	Volts	115/120	115/120
	Cycles	60 Hz	60 Hz
	Amperes	15	15
Plumbing Requirements		Tempered water supply. 4 gallons per minute. Gravity drain required.	Tempered water supply. 2 gallons per minute. Gravity drain required.
Operation		Continuous, automatic, daylight	Continuous, automatic, daylight
Speed (feet per minute)		3.7	5 or 10 (see Note 5)
Cooling Provision		(See Note 6)	(See Note 6)
Film Capacity (feet)		100	100
Ordering Information (see 1.03)		See BSES Item 3440	See BSES Item 3441

Notes

- As noted in 1.01, in selecting an equipment item, consideration should be given to the availability of adequate dealer service. This is especially important for processors.
- Processors involve installation costs for water supply, drainage, and power.
- Bell and Howell Type 1E and 1G film should not be processed in these processors.
- Orders for this processor must specify equipped with a motor wire guard No. 881-529 for Bell System application.
- Orders should specify 10 feet-per-minute operation, if desired.
- Processing temperatures recommended by the manufacturer of this processor should be used when processing any of the films recommended for Bell System use. If the processor is operated in an area in which, because of high ambient temperature, the recommended processing temperatures cannot be maintained, it will be necessary to provide air cooling facilities to reduce the ambient temperature in the area.

10.02 *High-Production Processor*

		HOUSTON FEARLESS LABMASTER MODEL L16/35M (See Notes 1 and 2)
Approximate Dimensions (inches)	Width	16
	Depth	112
	Height	55-3/8 (see Note 3)
Approximate Weight (pounds)		700
Power Requirements	Volts	115/230
	Cycles	60 Hz
	Amperes	23
Plumbing Requirements		Tempered water supply. 10 gallons per minute. Drain required.
Operation		Continuous, automatic, daylight (dark room loading)
Speed (feet per minute)		10-40
Film Capacity (feet)		1000
Accessories		Replenisher tanks Air compressor for squeegee
Ordering Information (see 1.03)		Purchase locally

Notes

1. This processor requires large quantities of solutions and extensive installation for water supply, drainage, and power.
2. This processor requires modifications to process Bell and Howell Type 1E and 1G films.
3. Film feed section includes an elevator. Overall height is 102 inches with elevator raised to maximum.

11. SPLICERS

		MIRACLE SPLICER PRESTOSEAL MFG CORP (See Note 1)
Film Handled		16mm (adapter head for 35mm available)
Approximate Dimensions (inches)	Width	11-1/2
	Height	9
	Depth	18-7/8
Approximate Weight (pounds)		17-1/2
Power Requirements	Volts	110/120
	Cycles	60 Hz
	Amperes	1.5
Type of Splice		End-to-end or butt splice
Controls		Timer, heater current rheostat
Indicators		Heater current ammeter, timer, and 2 x 3-1/2 inch inspection screen (back-lighted)
Ordering Information (see 1.03)		See BSES Item 3400

Note

- Orders should specify Model TF 100.1 (16mm film) or TF 100.5 (16mm and 35mm film).

12. READERS

		DESK TYPE			
		RECORDAK MICROSTRIP READER MODEL PGRW (see Note 1)	NORTHSTAR 1 (see Note 2)	EDNALITE MODEL 1624 (see Note 3)	EDNALITE MODEL 1625
Screen Size (inches)		14 x 14	14 x 14	11-1/2 x 14-1/4	11-1/2 x 14-1/4
Screen Type		Translucent	Translucent	Translucent	Translucent
Approximate Dimensions (inches)	Width	21-3/4	16-1/2	15	15
	Height	20-5/8	22	22	22
	Depth	28	25-3/8	20	20
Approximate Weight (pounds)		82	53	32	32
Power Requirements	Volts	117	115	115	115
	Cycles	60 Hz	60 Hz	60 Hz	60 Hz
	Amperes	2.9	3.5	4	4
Magnification		22.5X	24X	24X	24X
Film Transport		Manual	Motorized	Motorized	Motorized
Image Control	Focus	Adjustable	Adjustable	Adjustable	Adjustable
	Image Rotation	360 degrees	360 degrees	(see Note 4)	360 degrees
	Scan	Adjustable	Adjustable	Adjustable	Adjustable
	Magnification	Fixed	Fixed	Fixed	Fixed
Ordering Information (see 1.03)		See BSES Item 3406 (see Note 5)	See BSES Item 3428	See BSES Item 3427	Purchase Locally

Notes

1. This reader requires the use of a special Microstrip holder that is a rigid plastic sleeve containing strips of microfilm images up to 12 inches long. The holders are housed in an access file unit that is 5-7/16 inches high, 10-3/4 inches wide, and 14-1/2 inches deep. These units have a capacity for 100 holders. The units are modular in design, and 10 units can be arranged around the reader on the reference work station (27 inches high by 61 inches wide by 30 inches deep). A Microstrip filler (5-1/8 inches high by 32 inches wide by 6-5/8 inches deep) consisting of a film punch and cutter may be used to manually load the film into holders.
2. This reader will accept 3M cartridges only.
3. This reader will accept Kodak magazines, 3M cartridges, or 16mm reels.
4. The image rotation feature is not provided on the 1624 reader.
5. Orders for this reader should specify 22.5X magnification.

SECTION 006-220-100

13. DISCONTINUED EQUIPMENT AND MATERIALS

13.01 Manufacture of the following equipment, still considered acceptable, has been discontinued.

(a) Cameras

- Recordak Reliant 500 Model RS
- Recordak Triplex Microfilmer Model RF-1
- Remington Rand Film-A-Record Model 555
- Recordak Rotomatic RR1
- Recordak Rotomatic RR2
- Recordak Reliant 600 Model RW

(b) Densitometers

- Macbeth QP-10, QT-20, TD-100 Transmission Densitometer

(c) Files

- Yawman and Erbe Model 8936 and 8636
- Remington Rand Model 26105 and 26046

(d) Splicers

- Prestoseal Hercules Presto Butt weld splicer Model 1000.1

(e) Light Box and Rewind Units

- Hall and McChesney light box assembly
- Film Editor No. K-1-A-901

(f) Films

- Recordak Micro-File Type 7454
- Ozalid Unit Gamma
- Tecnifax K-Tone 115-100

(g) Reader-Printers

- Filmac 100
- Filmac 100M

(h) Readers

- Remington Rand Film-A-Record Electronic AO Reader Catalog No. F077
- Recordak Medalist Reader Model PL
- Recordak Lodestar Reader Model PS
- Recordak Lodestar Reader Model PS 1

REASONS FOR REISSUE

1. To specify Bell System Evaluation Standards (BSES) in place of Bell System Standards (BSS) Item numbers.
2. To add Bell and Howell Director II Recorder and Recordak Reliant 700 Model RW cameras and to delete Recordak Reliant 600 Model RW camera (2.).
3. To delete information covering Macbeth TD-100 transmission densitometer (3.).
4. To add Steelcase No. 1845L file and to delete information covering Remington Rand files (4.).
5. To delete film packaging information (5.).
6. To add Recordak AHU Type 7452 (formerly 50-136) and Recordak AHU Type 7460 silver film and to delete Recordak Micro-file Type 7454 silver film (5.).
7. To add Kodak 2950, Kodak 3950, Bruning 91-1541, Scott P4-217, and GAF 2610 PH diazo film and to delete Ozalid Unit Gamma and Tecnifax K-Tone 115-100 diazo film (5.).
8. To revise ordering information for the Bausch and Lomb microscope (8.01).
9. To add Ednalite Model 1625 reader and to delete Recordak Microstrip Reader Model PS 1 (12.).