

## POLAROID CORPORATION

In June, 1948, officers of the Polaroid Corporation of Cambridge, Massachusetts, were faced with the problem of drawing up a schedule of prices for the recently designed Polaroid Land camera and Polaroid film. The Polaroid camera, invented and patented by the company's president and research director, Dr. Edwin H. Land, represented a significant advance in camera development, according to the opinion of many in the industry. Basically, the camera permitted the user to take a finished print from his camera one minute after taking the picture, hence eliminating the time and trouble involved in having film developed. The product, being unique, presented a difficult problem to company officials in deciding upon a suitable price and discount schedule for it.

The Polaroid Corporation was incorporated in Delaware in 1937 to acquire and develop patents held by Edwin Land in the field of light polarization. Dr. Land had become interested in light polarization while at Harvard University in the early 1930's. In 1932, he had set up Land-Wheelwright Laboratories, Inc., in Wellesley, Massachusetts, to continue research in this field. In 1934, he undertook production of photographic light filters for Eastman Kodak, and in 1935 began to sell Polaroid sun glasses. Growth was rapid, and in September, 1937, the Polaroid Corporation was established to facilitate providing outside capital. Dr. Land remained in control.

Sales increased rapidly in the ensuing years particularly during the war when the company made goggles, optical instruments, filters, and training equipment for the government. During this period of peak sales, Dr. Land and Carlton P. Fuller, Polaroid's vice president and treasurer, became concerned with plans for the postwar period. They realized that the end of the war would bring cancellation of government orders and a slump in sales, and they began to consider means of maintaining Polaroid's position in the peacetime market. It was at this time that Dr. Land got the idea for a picture-in-a-minute camera and proceeded with the development work that resulted in the Polaroid camera. By 1947 the process was judged to be ready and the company began planning the introduction of the new product to the market.

The Land camera required two rolls, one at either end of the camera. One roll unwound negative and the other a special positive paper with small pods of chemical attached. To start the development, the user pulled a tab at the end of the camera. This action advanced the film and paper together between rollers, squashed the pods, and created a thin layer of chemical jelly.

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This case was prepared as the basis for class discussion rather than to illustrate either effective or ineffective handling of an administrative situation.

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The jelly, in turn, developed the film. The user then could take this finished print from the back of the camera.

In the same year that Polaroid announced the invention of the camera, the company suffered a loss of nearly \$1 million; wartime sales had trailed off at the same time that heavy expenditures were being made for research and development. The company's prospects for recovery were tied to a considerable extent to the Land camera. The wide public interest and the tremendous amount of publicity generated by Polaroid's announcement, however, reassured executives as to the soundness of their own judgment and encouraged them during the next year and a half when further research and testing brought the total invested in developing the camera to approximately \$1,250,000. The company's financial records for these years are given in Exhibits 1 and 2.

Little information was available concerning the details of the photographic market or the buying habits of consumers. One estimate, made by the publishers of a photography magazine, was that about \$500 million would be spent for photographic equipment and supplies in 1949.<sup>1</sup> The magazine's study also made the following breakdown of the total market:

1. The amateur market	\$150,000,000
2. The professional-commercial market	50,000,000
3. The industrial market (blueprints, photoengraving, microfilm, etc.)	300,000,000

The number of amateurs engaged in photography in 1948 was estimated at 28,000,000. The magazine's study divided these into three rough groups -- new amateurs or casual photographers, seriously interested amateurs, and expert or salon-exhibiting amateurs. The last two classifications, while a numerical minority, accounted for 80% of total annual sales to amateurs.

In a survey of its readers, the photography magazine found that the average value of cameras owned by readers was \$273. Cameras valued at less than \$50 were owned by 10.9% of the readers, \$50 to \$100 by 20.6% of the readers, \$100 to \$250 by 27.1%, \$250 to \$500 by 25.3%, and \$500 to \$1,000 by 13.8%. Other studies made by the Eastman Kodak Company indicated that about 36,000,000 families in the United States owned at least one camera, and about 90% of these cameras were of the box or folding type. Of the total families owning cameras, some 26,000,000 were believed to have taken pictures during the most recent years. Exhibit 3 contains selected data on photographic equipment from the 1947 Census of Manufactures.

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<sup>1</sup>This estimate was based on the records of a representative group of photographic equipment and supply manufacturers.

In considering the design of the camera, Polaroid officials gave considerable thought to the potential customer and his needs. It was their opinion that for the most part photographic equipment sales were made to amateurs without much technical skill in the manipulation of complex mechanisms such as were found in higher price cameras. In attempting to design a product that would appeal to this mass market, Polaroid officials therefore adopted as policy "to make this camera so simple that anyone could get good pictures under any lighting conditions without knowing anything about photography."

The features of the Land camera were designed with an eye to simplicity, versatility, and distinctiveness. Although the lens, as finally adopted, was small, it had a depth of field sufficient to compensate for most bad guesses about distance. The shutterlens system was coupled to one setting, thus reducing the complication of taking an acceptable picture. The system for loading and operating was made simpler than that of any quality camera on the market.

Production of the camera was contracted out to the Samson United Company of Rochester, New York, which agreed to produce the finished cameras at a cost to Polaroid of \$33.25 a unit.<sup>1</sup>

Polaroid itself undertook to make the special film required. It was estimated that the average camera owner used seven or eight rolls of film a year, but Polaroid - anticipating an increase in film usage with the Land camera - planned to produce film at three times that rate, or approximately two rolls for each user each month. Anticipated sales were 1,560,000 rolls of film the first year. Company officials estimated that an investment of about \$500,000 would be required in film-manufacturing facilities sufficient to handle the first few years' anticipated sales. Manufacturing costs would probably level off at about 57 cents a roll after film had been in production for several months. The type of film designed for use in the camera would take eight exposures and produce a print measuring 3 1/4" x 4 1/4", or somewhat larger than most contact (unenlarged) prints. Initially the prints would be in a sepia tone; color photographs could not at first be taken with the camera.

One question under consideration during the early months of 1948 concerned distribution channels. Traditional channels in the photographic equipment business were through photographic distributors to photography, department, jewelry, household appliance, sporting goods, and optical goods stores. Film was distributed to photography stores and drug stores by photographic distributors and occasionally by drug wholesalers.

Traditional trade markups on cameras and equipment were list price less 33 1/3% for the retailer, and retailer's price less 15% for the distributor.

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<sup>1</sup> All cost figures relating to the camera and film have been disguised.

Retail markups on film varied slightly, ranging from 33 1/3% to 40% on black and white film depending on volume, and averaging about 30% on color film. The distributor received 15% of the price to retailers.

Sales executives at Polaroid decided to sell direct to 5,000 selected retailers, primarily photography stores and department stores. Initially, film would only be sold through these same outlets, but officials anticipated that, as demand for the film grew, distribution would be expanded to cover drug stores as well. The introduction of both camera and film would be on a market-by-market basis, starting with Boston and later spreading to include all other major urban markets. Officials hoped for a sales volume in the first year of at least 120,000 cameras, and production schedules were tentatively set on that basis.

A preliminary estimate of total selling and promotional expense for the first year of camera sales was set at \$1,100,000. Following is an excerpt from a memorandum by the sales promotion manager outlining these promotional plans:

It is expected that we shall be required to add to our sales force about 24 men during the year, at an average cost of \$10,000 for salary and expenses. This will total \$240,000 for the first 12 months.

Our advertising agency has been requested to prepare a promotional budget totaling \$600,000 and including the following activities:

- Dealer direct mail work
- Dealer announcement dinners
- Window and counter displays
- Salesmen's and dealers' portfolios
- Demonstration materials
- Advertising space and time
- Publicity

The balance of \$260,000 is for the present unallocated, to be held as a reserve against possible requirement for increased activity in order to move the camera quota.

In entering each city, Polaroid planned heavy expenditures for advertising, utilizing newspapers, radio, and television. Dealers were to be invited to an announcement dinner at which the camera would be demonstrated, promotional plans outlined, and orders solicited.

Because the Polaroid camera was unique, it was difficult to compare it on a price basis with cameras then on the market. Prices of conventional cameras varied widely from several dollars for a box camera or Brownie to as much as \$1,000 for high-speed, precision-made cameras. Models with variable focus and shutter speeds typically began at about \$40 and went up from there.



A similar problem existed for film. While the Polaroid film was essentially black and white as contrasted to color, it was not strictly comparable to standard black and white film. It developed itself, for example, and yet gave no negative from which further prints could be made. A mail service, however, was set up to provide additional copies inexpensively. The Polaroid print also was somewhat larger than standard black and white prints. A schedule of prices for standard film and for developing is shown in Exhibit 4.

In setting prices on the camera and film, officers of the Polaroid Corporation recognized that a certain amount of guesswork was unavoidable. Nevertheless they were convinced that their decision as to price would play a major role in the success or failure of the introduction of Polaroid's new product line. The sales promotion manager, commenting on the pricing problem, said that the problem "is one which bears more relation to the speed of return of our investment than it does to actual manufacturing cost. We probably wish to avoid price reductions during the first year, and thus we are cautioned against deliberate overpricing in order to skim the cream off the market. Too low a price, on the other hand, deprives us of income needed to repay investment and expand the market."

Exhibit 1

POLAROID CORPORATION

Sales and Profits, 1938-1947

<u>Year</u>	<u>Net Sales</u>	<u>Net Profit After Taxes</u>
1938	\$ 195,038	\$( 72,970)
1939	760,867	27,947
1940	719,590	( 96,166)
1941	1,032,426	126,286
1942	4,119,121	97,831
1943	10,739,226	152,152
1944	13,262,330	373,284
1945	16,752,466	449,425
1946	4,366,025	(335,644)
1947	1,503,608	(954,410)

Source: Moody's Industrials, 1939-1949.

Exhibit 2

POLAROID CORPORATION

Balance Sheet, December 31, 1947

Assets

Cash	\$ 279,600
Accounts receivable	87,600
Inventory	768,100
Tax claim	<u>1,110,000</u>
Total current assets	\$2,245,300
Machinery, net	331,900
Patents, etc.	153,600
Prepayments	<u>53,200</u>
Total assets	<u>\$2,784,000</u>

Liabilities & Capital

Accounts payable	\$ 73,700
Accruals	18,800
Provision for taxes	<u>42,700</u>
Total liabilities	\$ 135,200
5% Cumulative first preferred, par value \$50.00 a share	900,000
\$2.50 Cumulative second preferred, par value \$5.00 a share	35,000
Common, par value \$1.00 a share	404,400
Capital surplus	2,105,600
Operating deficit	<u>(796,200)</u>
Total liabilities and capital	<u>\$2,784,000</u>
Net working capital	\$2,110,100

Source: Annual reports.

Exhibit 3

United States Shipments and Interplant Transfers of  
Photographic Equipment and Supplies, 1947

	<u>Quantity</u>	<u>1947 Total Ship- ments and Inter- plant Transfers Value F.O.B. Plant</u>
<u>Photographic equipment and supplies,</u> (excluding film)	-	\$433,807,000
1. Motion picture equipment	-	90,102,000
2. Still picture equipment	-	95,822,000
a. Variable focus with adjust- able shutter speeds		
- using roll film 35 mm. or under	322,392	11,075,000
- using roll film 35 mm. or over, and sheet and pack film	402,368	11,796,000
b. Fixed focus and/or time and single shutter speed		
- using roll film 35 mm. or under	134,434	934,000
- using roll film over 35 mm.	5,427,724	15,450,000
c. Other types	-	56,567,000
3. Film, total all types (in total square feet sensitized material)	619,142,000	142,773,000
a. Sheet film and pack film	32,078,000	12,596,000
b. Other film (including motion picture, black and white, and color film, amateur roll film, still color film, aerofilm, microfilm, etc.)	587,064,000	130,177,000
4. Other photographic equipment	-	105,110,000

Source: U. S. Dept. of Commerce, 1947 Census of Manufactures, Product  
Supplement, p. 186.

Exhibit 4

Representative Retail Prices Per Roll of Photographic Film

<u>Type*</u>	<u>Black and White</u>	<u>Developing Cost</u>	<u>Color**</u>
#127	\$ .40	\$ .20	\$1.75
#120	.45	.20	1.98
#620	.45	.20	1.98
#116	.55	.20	2.34
#616	.55	.20	2.34
#135 (20 exposure)	.87	.30	3.25
#135 (36 exposure)	1.10	.35	4.95

\*All film (except #135) is what is known as standard 8-exposure film, but number of exposures actually received from it depends on size of camera. Actual exposures frequently number 10 or 12.

\*\*Prices quoted on color film include charge for developing.