

at last!

twenty-four

2 1/4 pictures on

120 roll film

THE 12-EXPOSURE 2 1/4 x 2 1/4 paper backed 120 roll film may at long last be going the way of the dinosaur and the dodo. By the time you read this, Eastman Kodak should have available the new 220 2 1/4 roll film—same size spool, same width film. But instead of 32 in. of film for 12 2 1/4 shots there's slightly more than 61 in. for 24 shots.

How did all that film get onto the same size spool? Easy. The old, bulky, unnecessary paper backing with all those useless numbers on it has been eliminated. Result: a long roll on the same spool. Can you use it in your present camera? With a minor change in the winding mechanism of some cameras and with no

change in others. How much will the new film cost? About twice as much as a 12-exposure 120 roll film—which is only logical since you get twice as many pictures.

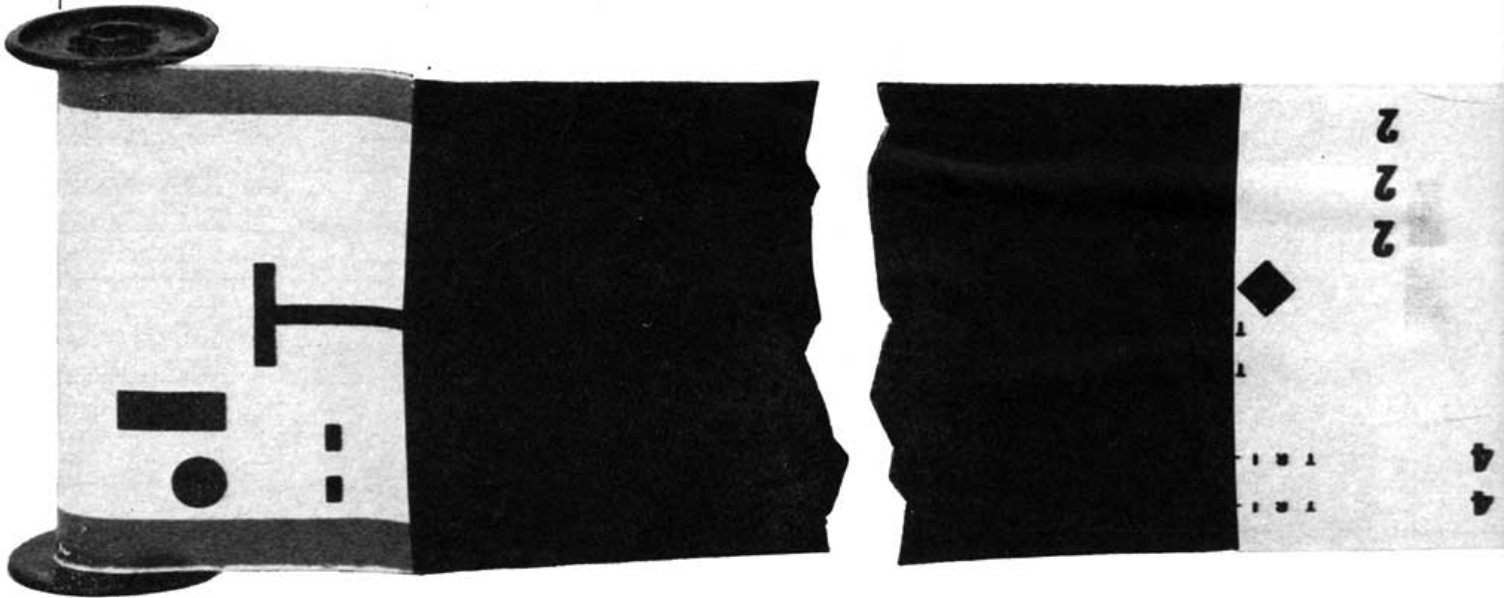
Before we get to answering the thousand or so questions about long roll, let's make a quick rundown on old 120 and see what (if anything) was and is wrong with it.

Roll film with paper backing goes back almost to the earliest days of box cameras. The paper backing provided the picture frame numbers in the ruby window at the rear of the camera. But camera design advanced. More and more cameras discarded the ruby window film advance in favor of a fully automatic system where

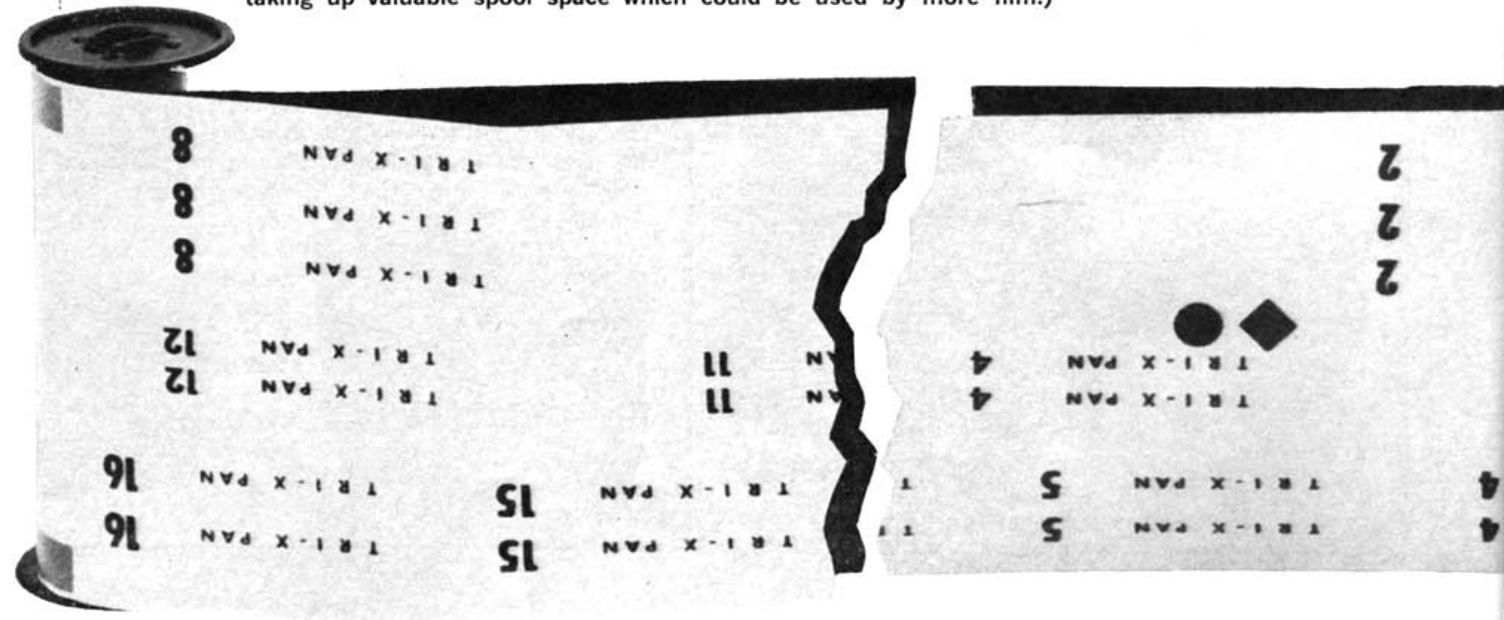
←(Light-tight paper trailer.)→

←(Unbacked 60 in. film allows 24 2 1/4 x 2 1/4 exposures.)→

←(Light-tight p



←(Entire 32 in. length of 12 exposure film is backed by paper taking up valuable spool space which could be used by more film.)



the counting of the pictures was made by a mechanical unit on the camera body. Gearing within the camera automatically spaced and stopped the film at the right point behind the lens for each shot. Such cameras needed at most just the No. 1 paper backing number. After that all was automatically done by the camera. But how about those 12 exposures?

For average amateur use 12 $2\frac{1}{4} \times 2\frac{1}{4}$ exposures are certainly sufficient on a roll. Even eight would do probably. But serious amateurs and professionals accustomed to the convenience of 20 or 36 exposures on 35mm film found 12 too little. The answer: own two or more cameras or a camera with expensive inter-

changeable 120 roll film backs.

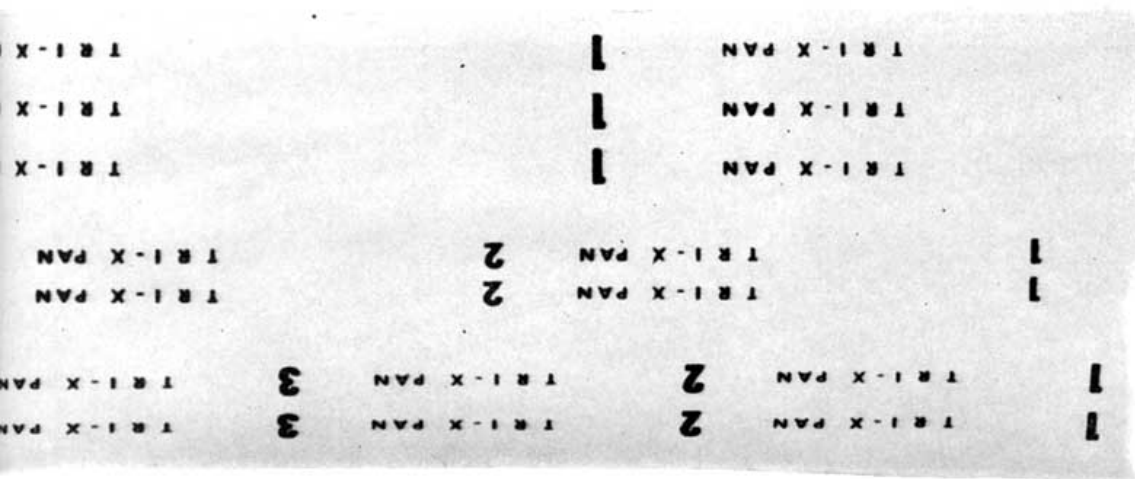
Owners of $2\frac{1}{4}$ reflexes weren't the only complainers. Many odd-ball, wide-angle and specialized cameras also used 120 film—the Brooks-Plaubel Veriwide, the Panox, our own Simon Nathan's Simon-wide cameras based on designs by Fritz Rotgan. These made as few as four pictures on a 120 roll.

Many photographers and designers have thought that 70mm perforated film (like 35mm film) would be the answer (see picture). The 70mm film, 17 ft. long, making 70 $2\frac{1}{4} \times 2\frac{1}{4}$ pictures on a roll, is housed in a giant metal film cartridge (see picture page 92) almost identical to the present 35mm cartridge. This film is avail-

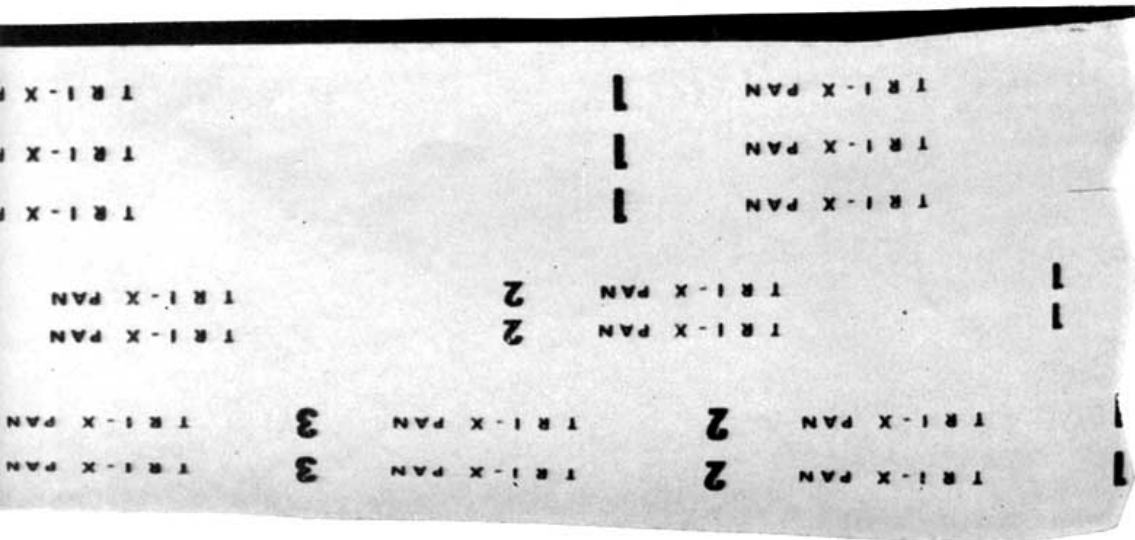
able (in limited supply) in many emulsions from Eastman Kodak Company, either in bulk rolls which allow you to load your own cartridges or in already loaded cartridges. While the cartridge proved successful in many specialized cameras and camera backs such as the Graphic 70 and the Linhof Cine Rolex 70 roll film back, there are many limitations.

1) Because film advances by the sprocket wheel arrangement like 35mm film, all present roll film cameras would have to be completely redesigned from the beginning to use 70mm film. 2) The cartridge is immense and would cause 120 roll film cameras to increase in size accordingly. (Continued on page 92)

leader overlaps only 9 in. of film to provide starting numerals for semi-automatic cameras.) →



New 220 roll film uses regular 120 film spool but allows twice the exposures by doing away with paper backing.



Old 120 roll film uses regular 120 film spool but has limited space for film because of useless continuous paper backing.

LONG ROLL

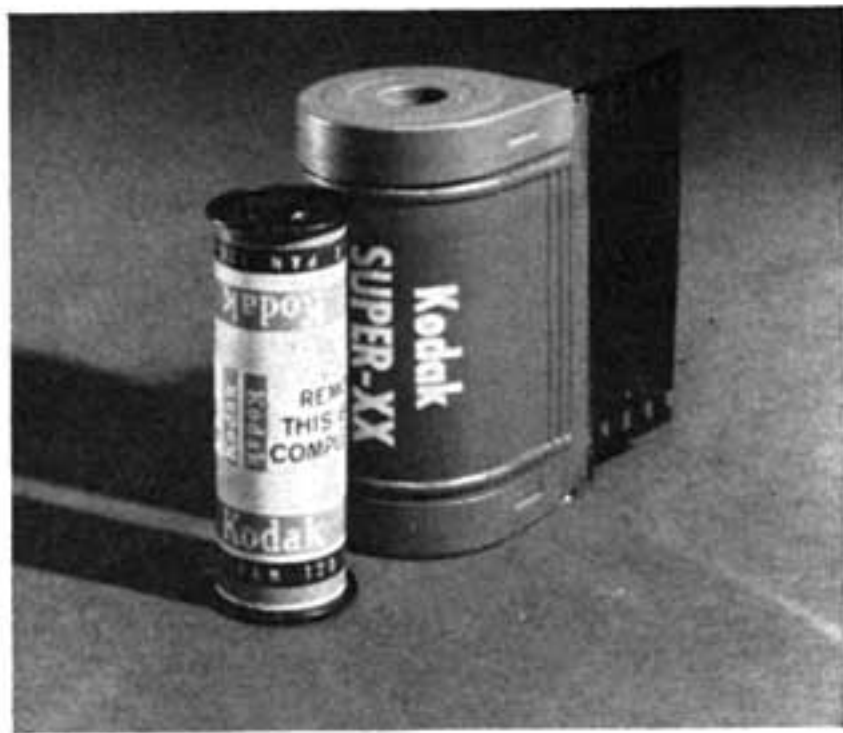
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3) The 70mm cartridge is expensive (\$9.65 for a 70-exposure roll of Kodak Tri-X Pan) and would hike film costs for the average professional and amateur photographer. In addition, isn't 70 exposures sort of too much? 4) The long lengths of exposed 70mm film cause processing headaches since only specialized 70mm equipment can handle it.

Still almost everyone felt the future of $2\frac{1}{4} \times 2\frac{1}{4}$ was in the direction of 70mm. Where else could it go?

French photo engineers thought they knew when they brought out a 150-exposure back for the Rolleiflex. The film was rolled on a special spool 2 in. in diameter and had front and back paper leaders to prevent exposure to light during loading. Kodak-Pathé made Tri-X film for it. Advantage: the film used the Rolleiflex's own film advance system. Disadvantage: bulkiness.

Konishiroku Photo Industry Co., Ltd., of Japan, not only makes the Konica cameras but also film—Sakura. To produce a small, easily handleable roll film aerial camera, the film technicians were required to furnish a long, 20-exposure 120 roll film with paper leaders at both ends attached to unbacked roll film in the center. Unfortunately, the Konica film only worked with the Konica camera—but here at last was the germ of an intelligent solution.



70MM VS. ROLL: Looks like giant 35mm cassette; requires bulky camera. Compare to roll film spool.

Where did long roll 120—oops—220 originate? We like to think (and it's probably true) that it was born around or near our Contributing Editor Simon Nathan. Those four shots per roll of 120 for his Simon-wide cameras finally got the best of him. The story is that Nathan took about 10 ft. of the French 150 film and wound it, in desperation, onto a 120 spool which he had stored in his wastebasket.

The paper leader attached to the beginning (or end) of the Kodak-Pathé was not practical, however.

On a standard 120 film spool, the film fogged to a fare-thee-well. You probably don't know it but the 120 roll film is not the full width of the 120 spool. The backing paper is wider and it is manufactured with *scived* edging. This means that the paper backing has

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LONG ROLL

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thinner, or tapered edging and it seals off the roll from light, layer by layer as it is exposed. The French 150 spool had avoided this problem by producing a narrower spool.

Simon's solution was obvious. Use a Kodak leader and trailer for 120 roll film which would maintain the light-tightness. Now how long should the new film be?

How should Kodak do it?

Simon thought that it did not depend so much on a specific number of exposures, but a length of film that could be processed in equipment compatible with present roll film processing gear—Nikor and Kindermann, FR Special, etc. To Nathan this meant about 60 in., the same as 36-exposure 35mm with leader. To the Calumet Manufacturing Co. this meant 64¾ in. Calumet engineers were building a product around their version of the long roll. The Calumet roll film holder goes into the backs of thousands of Speed Graphics, not to mention the popular 4 x 5 all-metal Calumet View Camera. Calumet went to Eastman for help as well as film manufacture.

Calumet pointed out to Kodak that since Kodak was already making 120 spools, cutting 120 film, had the packaging experience, it'd be a small matter to eliminate some of the paper backing and fill up the spool with film. No sooner said than done.

MODERN's Simon Nathan visited Kodak and he visited Calumet. Nathan allows that the Kodak product will be even better than his own concept of what was wanted. Kodak added 9½-in. of paper backing after the tape attaching point at the beginning of the roll. This immediately solved the problem for Hasselblad and other camera users since it provided the No. 1 on the paper backing needed for starting Hasselblads and also the starting point for many a semi-automatic twin-lens reflex user.

What cameras accept TX220?

Are you a Hasselblad user with your first roll of TX220? Turn the film through by hand to 1 as you usually do. Then tape your magazine back window so it's light tight. Two or three thicknesses of black masking tape seem to work. After the twelfth exposure, simply reset the counter and go for another 12.

MODERN talked to U. S.-based Hasselblad technicians. The possibility of a conversion of their magazine is said to be relatively simple.

A quick check by the U. S. importer of the Mamiyaflex C-2, C-3 and Bronica cameras indicated that here too a conversion to use number 220 roll film would be easy.

We'll start with two films

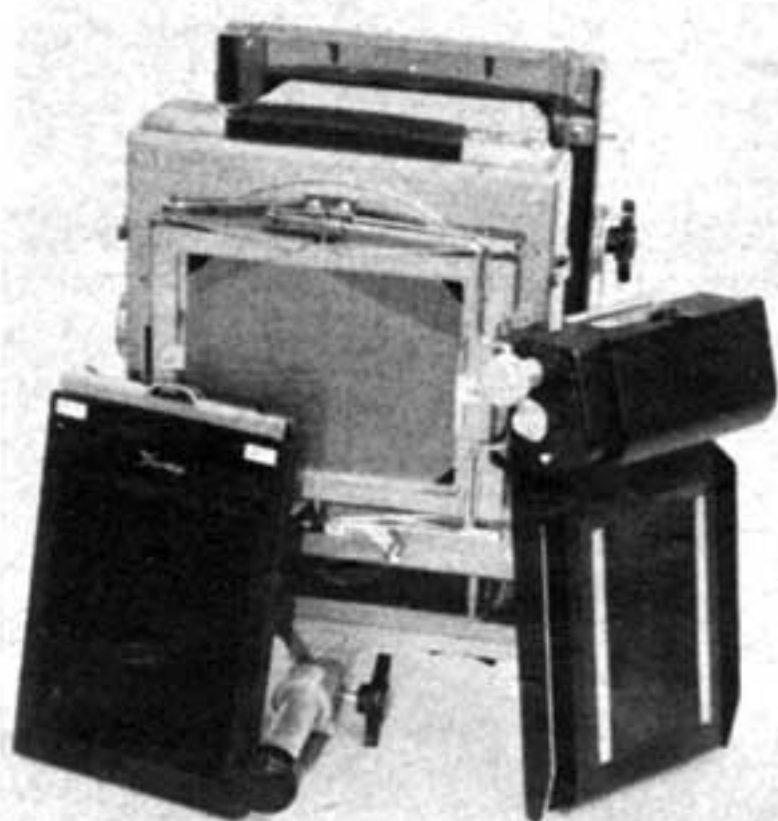
Film? Kodak Tri-X "220" film rated at ASA 320 and Kodak Ektacolor Professional Film, Type S (ASA 80) will be first films available. The hitch: film

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LONG ROLL

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will only be sold in a newly designed Kodak Professional Pack of 20 rolls, which will protect the film's foil wrappers. However, don't be surprised if some dealers are willing to split up a 20-roll package for good customers.



FIRST LONG ROLL USER: Calumet 220 roll film holder makes twenty 2 $\frac{1}{4}$ X 2 $\frac{3}{4}$ -in. pictures on a roll.

How about processing equipment? If you have an adjustable tank taking 36-exposure 35mm film, just adjust away to 120 roll film and the new 220 roll will fit ideally.

Nikor reels for their standard single and multiple tanks are soon to be available. Making rough samples is simple: take two 35mm spiral ends and attach to a 120 film core. Kindermann will most likely also have such reels if the demand warrants.

Both Eastman Kodak and Calumet deserve full credit for pooling their ideas and manufacturing know-how in solving the 12-exposure roll film dilemma so handily.—H.K., E.M. and S.N.

