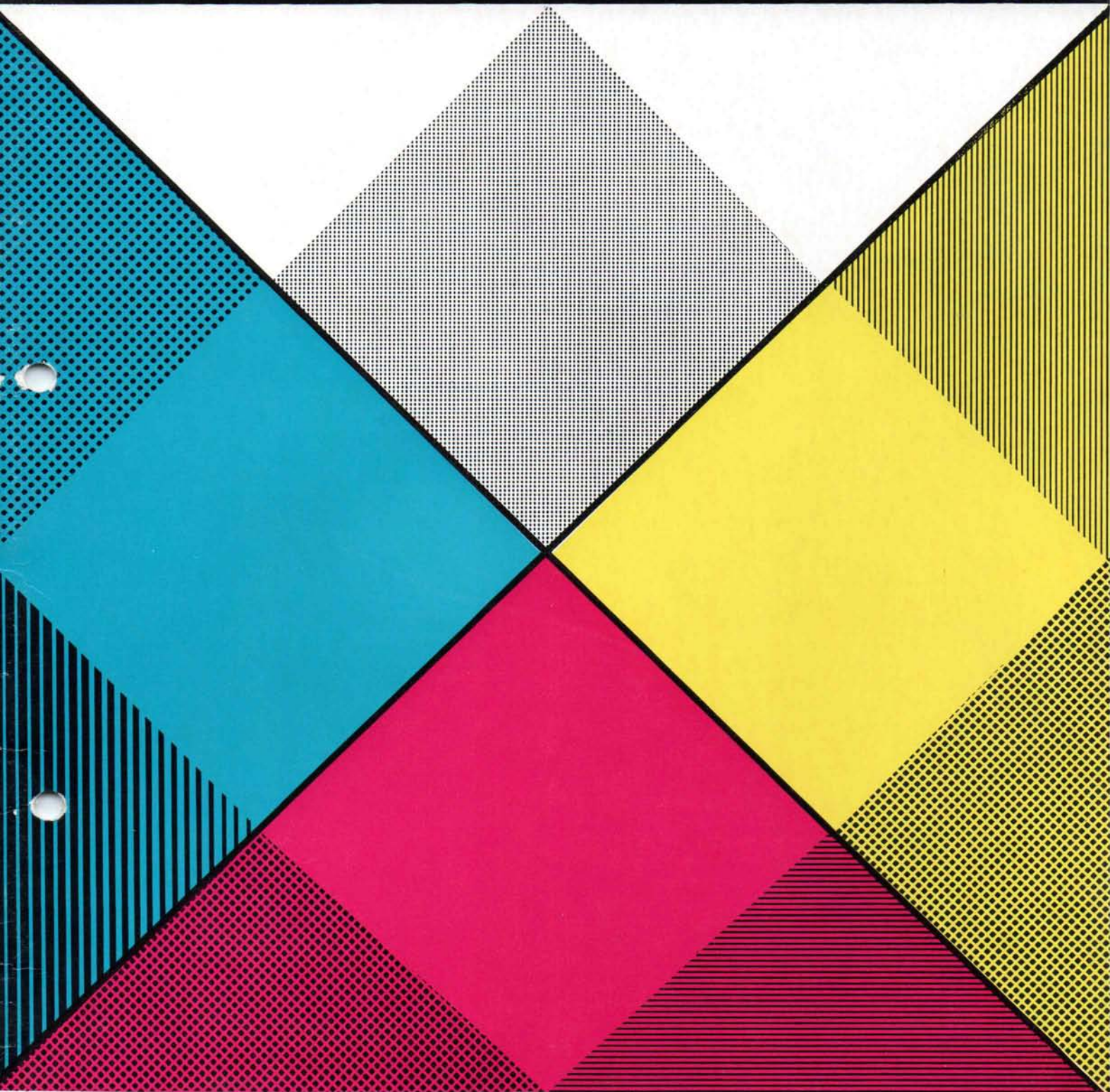


CHROMAGRAPH



DR. - ING. RUDOLF HELL · 23 KIEL

Hell Verein Kiel

CHROMAGRAPH

This new scanner developed by the Hell Organisation produces fully corrected, continuous tone colour separations for the three main printing processes.

The basis of the electronic masking is the two-channel system covered by Federal German Patent No. 940622.

It is the same two-channel system as is used in the Vario-Klischograph and it has proved itself admirably over a long period. The Chromagraph is produced in 3 models: C185, C186 and C187. They differ in size. The sizes are: 8 x 10 ins, 14 x 18 ins and 20 x 24 ins. The user can choose the size most appropriate to his requirements.

For the plate- and block-maker, who must process a large variety of originals in the shortest possible time, model C185 (8 x 10 ins) should be particularly economical. The Chromagraph can be made even more economically attractive if work is planned in such a way that several originals are scanned simultaneously. Of course care should be taken in such cases that all the originals have similar density characteristics.

Design

Basically the three models of the Chromagraph are identical.

The Chromagraph works with rotating drums. A scanning drum, which is a transparent cylinder, holds the original, and another cylinder is covered by the unexposed film. Both are driven by the same motor. The scanning head and the exposing unit are built in one aggregate, which is driven horizontally by a threaded spindle. The simple drive and application of modern design techniques give a most reliable unit which needs practically no servicing.

Electronics

The colour computer is in the front of the machine and all control elements are on the top of this unit. The colour computer is fully transistorised.

It is well known that longevity, very small power consumption and the small space required are only a few of the advantages of transistors.

Complete functional units are grouped on single printed-circuit boards, which, if necessary, can be easily exchanged.

Stabilisers make the machine completely independent of voltage or frequency variations of the current supplied.

The use of transistors and more than adequate safety margins play a large part in making the Chromagraph highly reliable. It also makes it practically free of the need for maintenance.

How it works

While the two cylinders rotate at a high speed, the original is scanned horizontally by the scanning head.

Light from a stabilised lamp within the glass cylinder passes through the transparency creating variations of light intensity and colour which are translated into electrical signals by means of two photo-multi-

Four colour offset reproduction from separation negatives produced on the Chromagraph Colour Scanner.

Scanning time five minutes per colour.

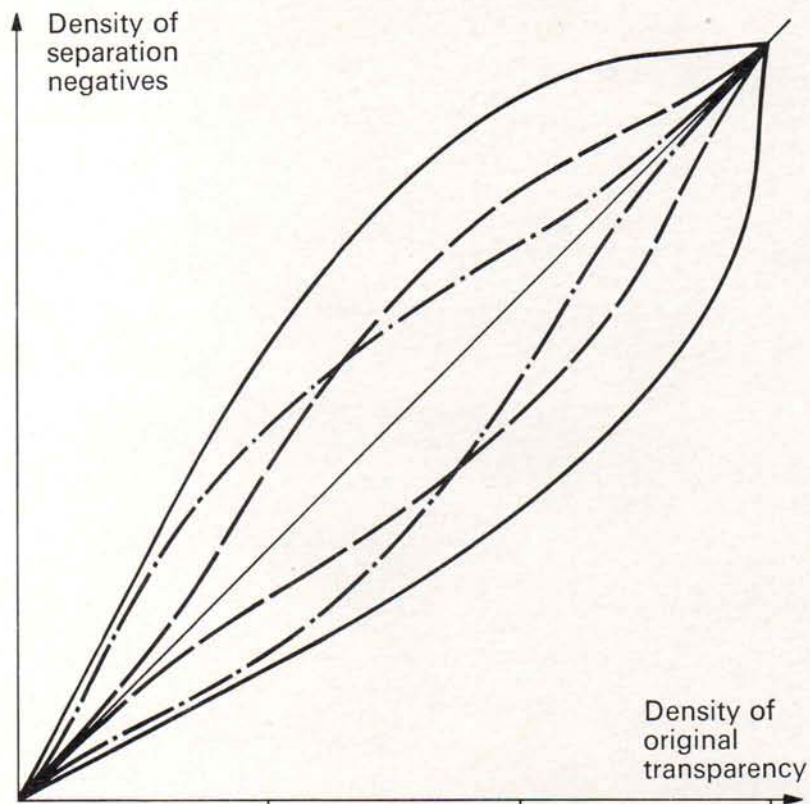
Screen positives were made directly from the Chromagraph negatives using Kodak Magenta contact screens.

No hand retouching has been carried out on this picture.

Original transparency by Studio Graphis, London.



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Highlight separation control



Middle tones separation control



Shadow separation control

pliers. One of these photo-multipliers (Channel 1) interprets the transparency through a normal separation filter while the other (Channel 2) is assessing the same point on the original through an adjustable correction filter. The electrical signals from both photo-multipliers are amplified separately and fed to the colour computer. In this part of the Chromagraph, signals in Channel 1, the separation channel, are modulated or modified precisely by the second channel, the result being a fully colour-corrected picture signal.

By using silicon transistors the electronic unit has been made temperature stable. However, as an additional precaution the whole of the electronic system is enclosed in a separate housing which is kept at a constant temperature of 40° C (104° F).

As a result of the inherent stability of the transistorised electronic circuits, any group

of settings will produce the same result at any time.

Three control knobs change the gradation curve in the highlights, middle tones and shadows respectively. These settings are completely independent of each other. By a combination of control settings one can obtain a large variation of gradation curves and therefore of colour separations. Should one wish to have an oscilloscope, the Chromagraph has a space provided for it and a socket for connecting it to the appropriate circuit.

High resolution

The separations obtained from the Chromagraph are very sharp and are practically continuous in tone, so that no moire can occur during screening. This is true whatever the screen ruling, screen angle or enlargement.

heads. Small pictures take a short time. Furthermore one can take three $2\frac{1}{4} \times 2\frac{1}{4}$ ins. transparencies, for instance, mount them around the circumference of the scanning drum, and the time for scanning all three at 500 lines per inch would be only 67 seconds, the same as the time for one!

Daylight cassette

Simple and time-saving. The Chromagraph can be operated in broad daylight. The film drum is in a daylight film cassette which can be loaded in the darkroom and then inserted in the Chromagraph. This system is not only simple but also increases the productivity of the machine because while it is operating the next film can be loaded into the next cassette.

All orthochromatic and blue-sensitive commercial films can be used in the Chromagraph.

Processing unit

The pre-set density values in the separations will be constant only if the film is always processed under standard conditions. The developing machine C870 works under such conditions. Factors such as developing temperature and times are automatically controlled. It is equipped with a nitrogen-burst mixing arrangement. The standard size is 15.7 ins x 19.6 ins but it can also be made for film size 19.4 ins x 23.6 ins.

No darkroom required

The Chromagraph can be installed anywhere. No dark-room is required for its operation. It works quietly and needs very little room. Special antivibration pads are incorporated in the base so that floor vibrations are not transmitted to the machine.

The variety of settings possible on the machine might suggest that it takes a long time to train a Chromagraph operator. It does not. Any operator familiar with reproduction techniques can become an expert in a very short time indeed. The setting procedure is standardised to a high degree. All factors which influence the ultimate printed product can be taken into account. These include the printing process to be used, ink, paper and the nature of the original. In this way and with the help of the standardised film processing equipment one can maintain an output of high quality colour separations.

Enough freedom has been left to the operator to vary colour density and gradation to meet any special requirements.

The operator can choose between 500 and 1000 lines per inch. The change is effected by the choice of diaphragm opening. The amount by which the colour separations should be enlarged depends on the quality required. At 500 lines per inch one can go as high as three times linear enlargement and still maintain the highest quality.

By switching over to 1000 lines per inch the cross-sectional area of the exposing light beam is reduced to a quarter of its size. This increases the resolution enormously. Scanning takes four times as long but enlargements can be more than six times the size of the original and still be of excellent quality.

Short scanning time

The Chromagraph is a fast-working colour-correction unit. Scanning time depends on the horizontal movement of the optic

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General view of Chromagraph showing compact arrangement of transistorised colour computer.



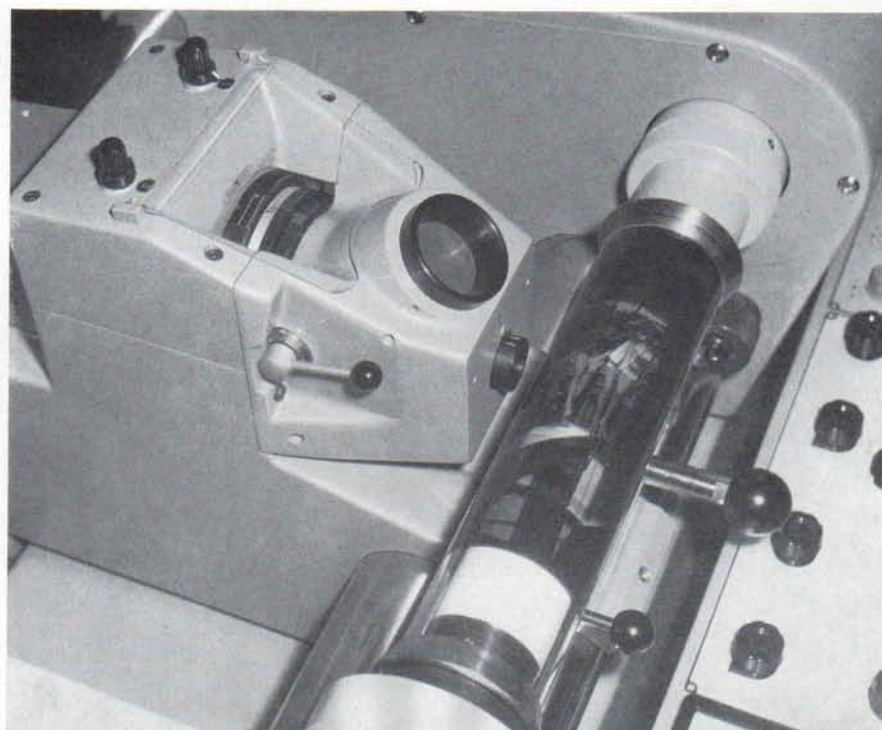
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Daylight cassette and part of control panel.



Scanning cylinder with optic head showing filter selector and optical viewing monitor.

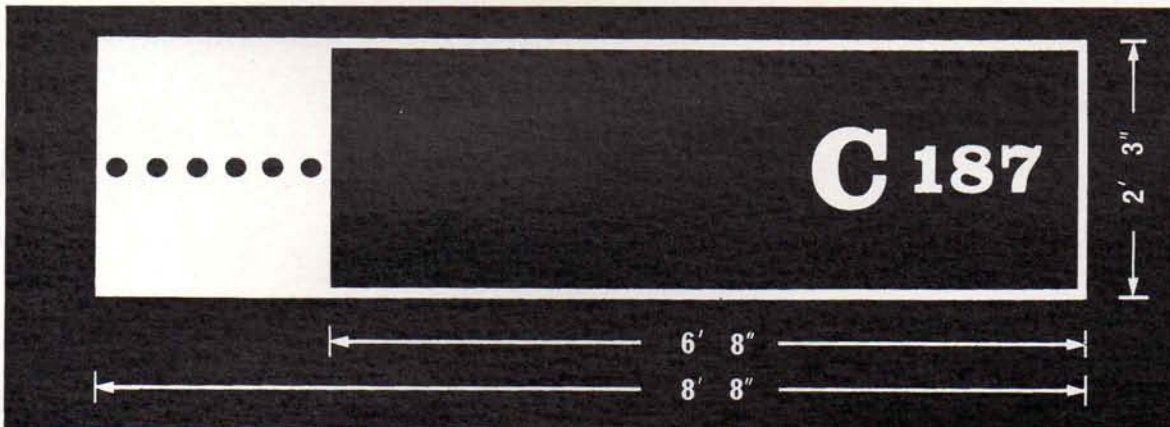
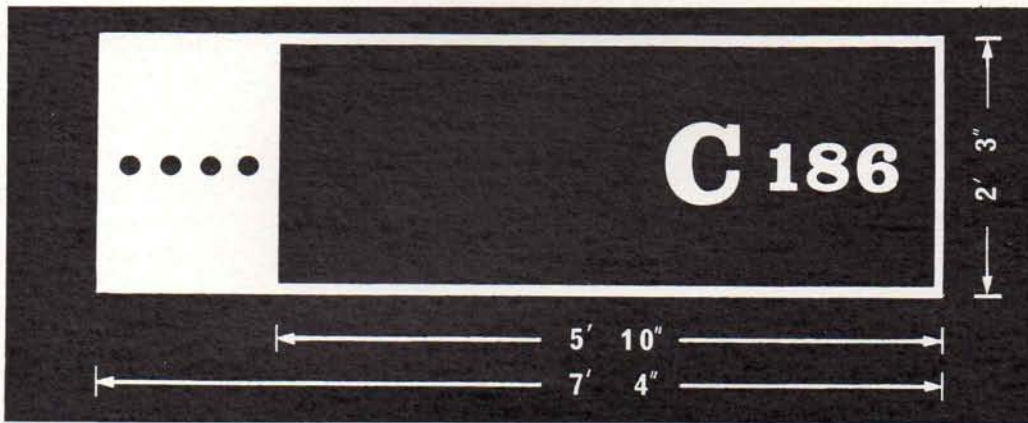
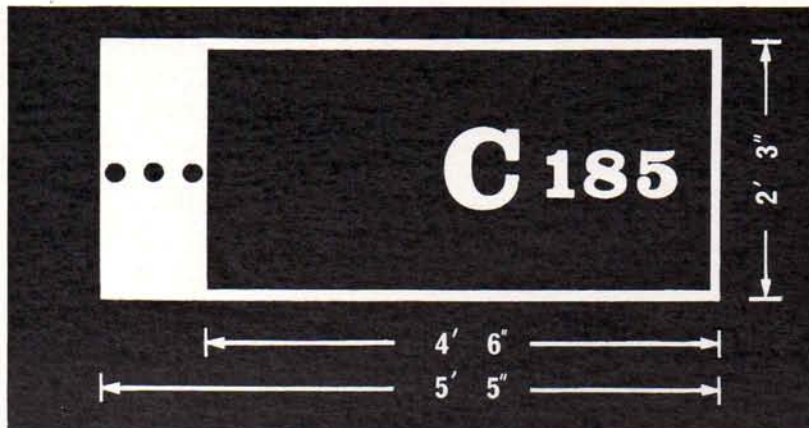


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The Chromagraph is available in three sizes:



Four colour letterpress reproduction from separation positives produced on the Chromagraph colour scanner. Scanning time five minutes per colour. Screen negatives were made directly from the Chromagraph positives. Original transparency by Tony Stone, London.

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Technical data

	C185	C186	C187
Overall length with support arm fully retracted:	4 ft. 6 ins	5 ft 10 ins	6 ft 8 ins
Overall length with support arm fully extended:	5 ft 5 ins	7 ft 4 ins	8 ft 8 ins
Overall width:	2 ft 3 ins	2 ft 3 ins	2 ft 3 ins
Height:	4 ft 1 ins	4 ft 1 ins	4 ft 1 ins
Weight:	approx. 7 cwts		
Electrical supply:	according to requirements		
Power consumption:	1 kVA.		
Maximum voltage variation:	+10 to -15%.		
	C185	C186	C187
Scanning cylinder diameters:	2 $\frac{3}{4}$ ins	4 $\frac{1}{2}$ ins	6 $\frac{1}{2}$ ins
Maximum film sizes:	8 x 10 ins	14 x 18 ins	20 x 24 ins
Lines per inch:	500 and 1000		
	C185	C186	C187
Scanning time at 500 lines per inch for maximum film size:	5 minutes	14 minutes	26 minutes
Scanning time at 500 lines per inch for 1 inch width:	28 seconds	47 seconds	66 seconds
Scanning time at 1000 lines per inch for 1 inch width:	112 seconds	188 seconds	264 seconds

OTHER PRODUCTS

Vario-Klischograph

for making screened, colour-corrected separations or half-tones, enlarged or reduced.

Standard-Klischograph

for making same-size half-tones or screened positives.

Helio-Klischograph

for the automatic engraving of photogravure cylinders.

Colorgraph

for making all four colour-corrected separations (continuous-tone or screened) simultaneously from one original, incorporating line work if required.

Acknowledgement

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