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FROM MANUSCRIPT TO PRINTED CHART

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A large number of countries produce nautical charts; principles and methods are similar. To-day chart production has become almost an industry. It is always beneficial to know how different nations actually practise the art as this makes for an exchange of ideas which could with advantage be adopted.

It is hoped that the following description of how we proceed "from a Manuscript to a Printed Chart" will be thought-provoking.

In Sweden most charts are very old, but each year some new ones are produced. The type follows various IHO Technical Resolutions and charts are printed in four colours – black, blue-green, magenta and yellow. The attached chart shows how the colours are used and how the line symbols are adopted to suit the scribing method. In some charts the topographic information (taken from topographic maps) is highlighted by height contours but this process is still in the experimental stage.

To print a chart in four colours, four inverse film originals (positive or negative) are needed, but before this is done some 30-40 other originals and diazo-prints are required. The flow-chart (Fig. 1) shows the long process that takes place.

The following steps are executed when a new chart is planned:

(1) The manuscript is drawn on a matt polyester sheet in pencil, in different colours on a scale generally 2 1/2 times larger than the scale of the printed chart. First the grid is plotted and shoreline and topo information are added. The topographic information is taken from the latest topo maps produced by the National Land Survey.

(2) The depths and depth contours are taken from the fair sheets. These are often very old and only 1 % of the waters along the Swedish Coast are adequately surveyed with proper geodetic control and depths obtained by modern echosounders. However there also exist recent surveys carried out by the method of parallel sounding.

(3) Other sources of information are old charts, notices to mariners, coast pilots and lists of lights, etc.

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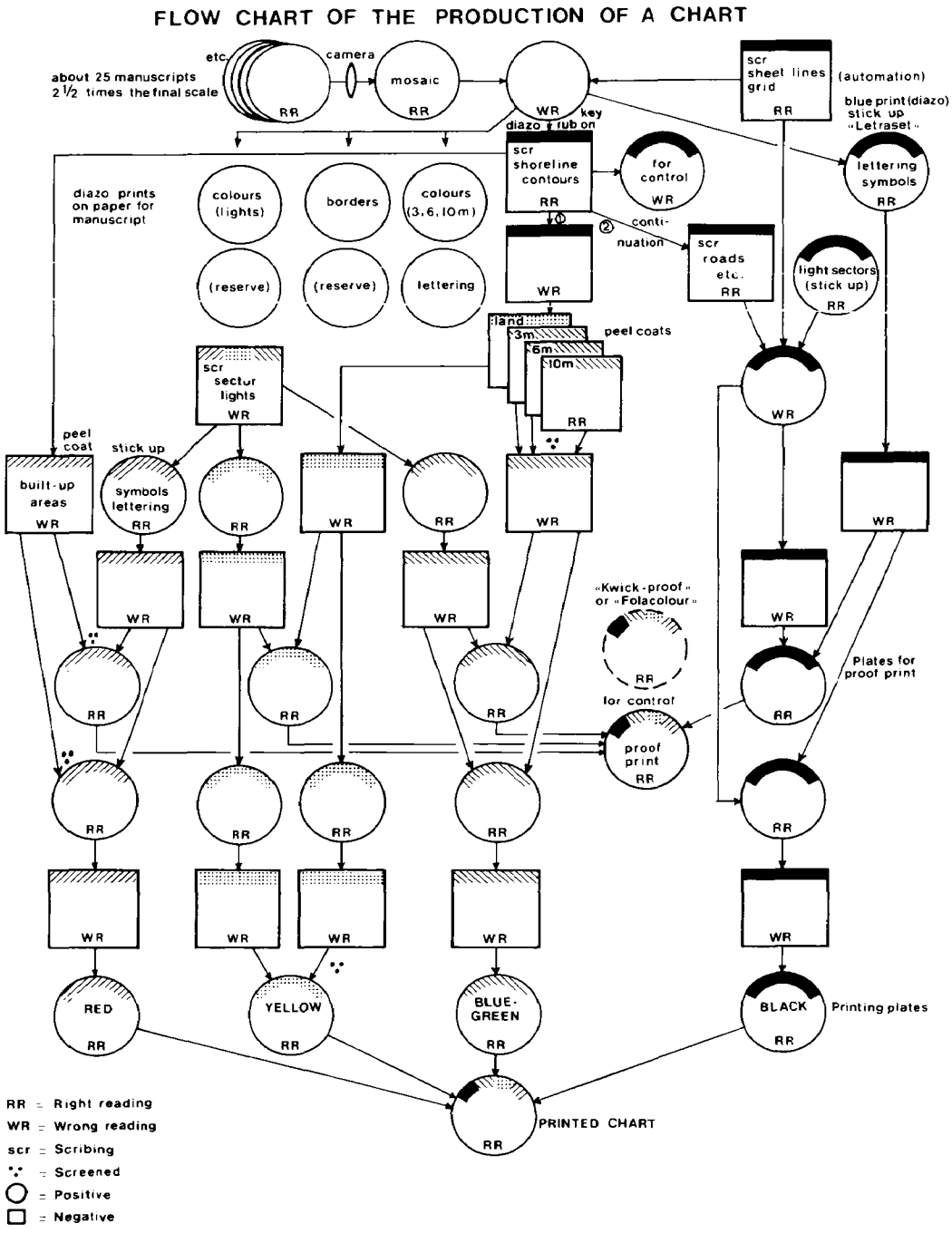

FLOW CHART OF THE PRODUCTION OF A CHART
about 25 manuscripts 2½ times the final scale
etc.
camera
mosaic
RR
WR
key
diazo + rub on
scr sheet lines grid
(automation)
blue print (diazo) stick up «Letraset»
diazo prints on paper for manuscript
colours (lights)
borders
colours (3, 6, 10 m)
(reserve)
(reserve)
lettering
scr shoreline contours
for control
lettering symbols
continuation
scr roads etc.
light sectors (stick up)
land
3m
6m
10m
peel coats
scr sectur lights
peel coat
stick up
built-up areas
symbols lettering
«Kwick-proof» or «Folacolour»
for control
proof print
Plates for proof print
RED
YELLOW
BLUE-GREEN
BLACK
Printing plates
PRINTED CHART
RR = Right reading
WR = Wrong reading
scr = Scribing
= Screened
= Positive
= Negative

FIG. 1

(4) For shallow water areas, where depths are old and inadequate, recent air photographs taken with infra-red film are used. These render it possible to determine accurately depths down to 3 meters. An interpretoscope is used for this purpose.

(5) Now all the manuscripts (about 25) are complete and after a very thorough verification these are reduced in the process-camera to the scale of the printed chart.

(6) The exposed film is developed in a machine with the input in the darkroom. The process takes only a few minutes.

(7) The reduced manuscripts are then mounted on a plastic sheet (mosaic) with a sufficient number of points constructed in a drawing machine. All sheets from the montage to the printing plates are punched to guarantee perfect registration.

(8) The sheet lines, the grid and sometimes the light-sectors are scribed in the drawing machine. This picture, together with the montage, is copied as a key for a new scribing sheet with diazo-rub on.

(9) Normally scribing is made in the final scale. But sometimes it is preferable to do it in the scale of the manuscript with the manuscript under the scribing sheet.

(10) Symbols which are not suitable for scribing are applied directly with "Letraset" and names and figures are printed on photopaper in the setting machine and then copied on to stripping film which is waxed.

(11) Masks for the tints of shallow water and land areas are made on peel coat. When the shoreline and depth contours are scribed, the sheets are made and stripped.

(12) Contours which are not open are coated. Masks for the coloured light sectors are made by a specially constructed instrument.

(13) All originals are made through contact copying (printing). Daylight film is used for ordinary negatives/positives and direct positives. For each colour a final inverse negative is prepared; this is "touched up" before making a plate. Pre-sensitized plates are used and developed.

(14) Specially made wet-strength offset paper (180 g) is used for charts. Prior to printing a specimen copy is made by "Kwick-proof" rub on or "Folacolour" method, the latter with one clear foil for each colour. In addition 30 proof copies are made in-house by the flat-bed press.

(15) These copies are 'proofread' by various authorities responsible for different activities.

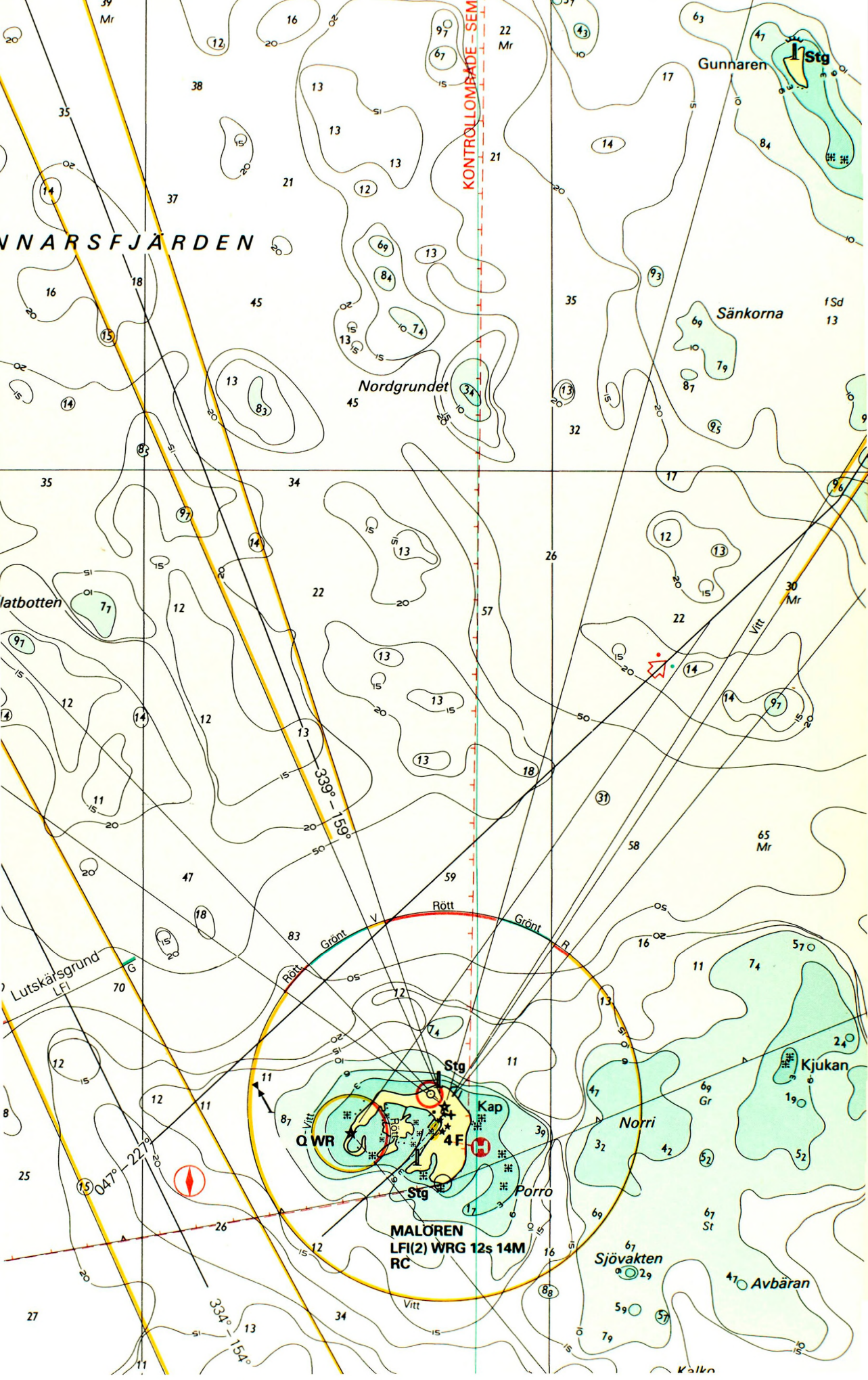
When the proofs are returned, the originals are corrected and final plates are made.

(16) The Department has one flat-bed press and four rotary offset presses in various sizes. These are sufficient for all charts produced by the Department.

(17) Demand for charts for the next six months is estimated and only such a number as required is printed. Charts are not manually corrected.

(18) Every six months a new edition is printed, and prior to publishing the new edition the originals are corrected and brought up to date.

(19) Charts are sold through a hundred chart agents, book sellers and ship chandlers, and every effort is made to meet their demands within 24 hours.


KONTROLLOMRÅDE – SEM
Gunnaren
Stg
Sänkorna
Nordgrundet
Lutskärsgrund
LFl
G
339° – 159°
047° – 227°
334° – 154°
Rött
Grönt
Vitt
Stg
Kap
Q WR
4 F
Stg
Porro
MALÖREN
LFl(2) WRG 12s 14M
RC
Norri
Kjukan
Sjövakten
Avbäran