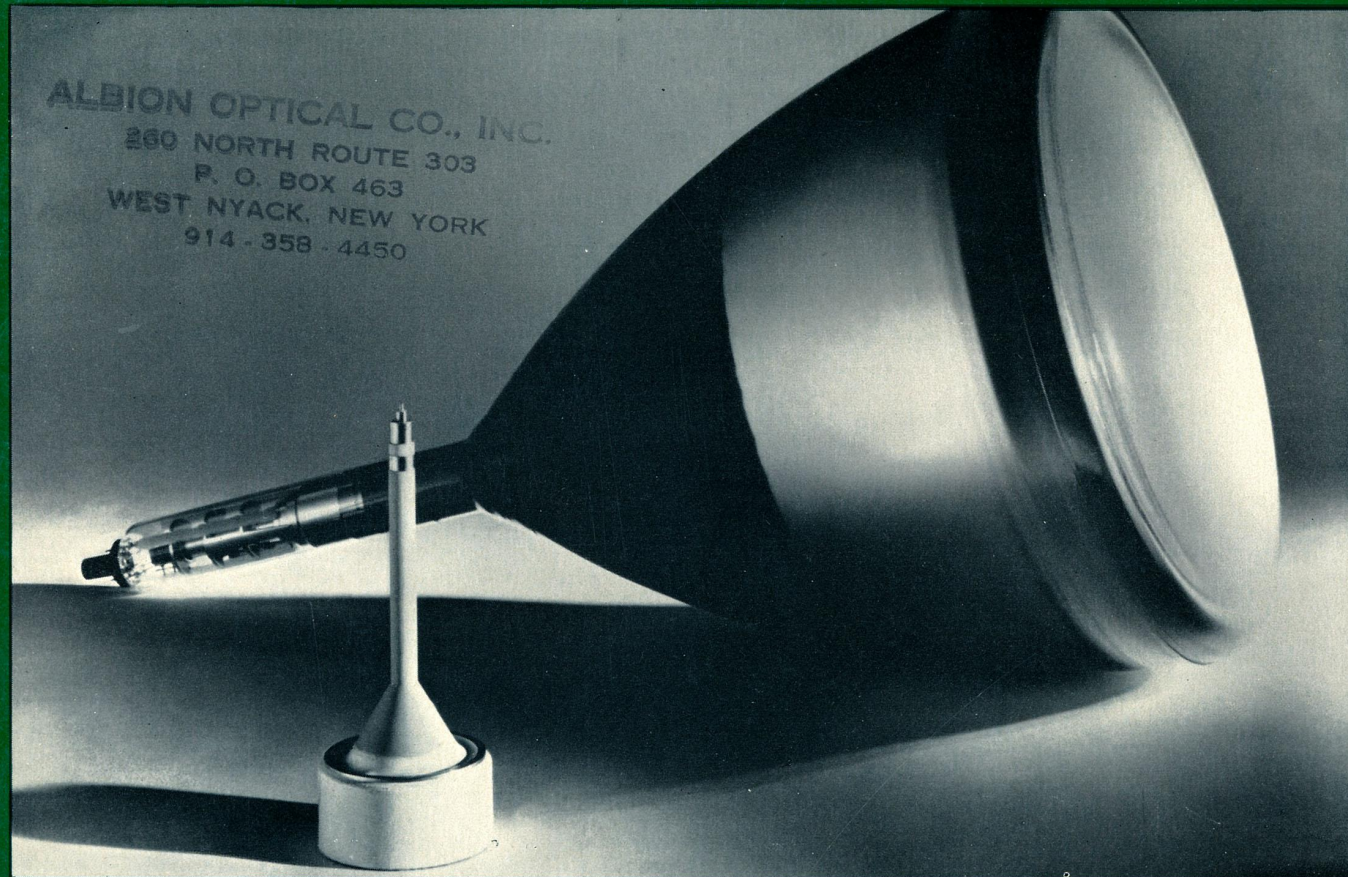
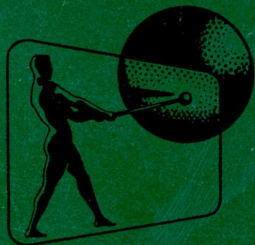


RANK ELECTRONIC TUBES



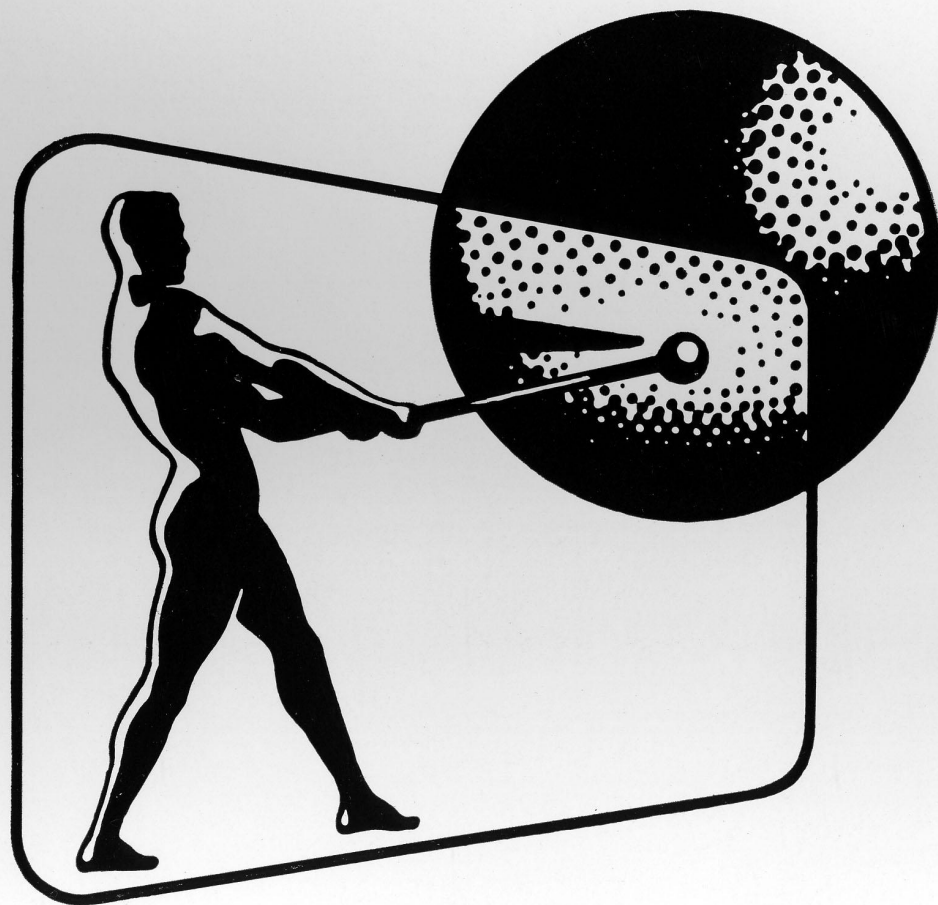
CATHODE RAY TUBES CATALOGUE



THE RANK ORGANISATION, SIDCUP BY-PASS, SIDCUP, KENT

TELEGRAMS: CINTEL, SIDCUP

TELEPHONE: LONDON, FOOTSCRAY 5541



CONTENTS

Page

2	<i>Radar Tubes</i>
4	<i>Instrument Tubes</i>
6	<i>Scanning Tubes</i>
8	<i>Airborne Bright Display Tubes</i>
9	<i>Airborne Recording and Display Tubes</i>
10	<i>Matricons</i>
12	<i>Special Purpose Display Tubes</i>
13	<i>Design Information</i>
15	<i>Equivalents List</i>
20	<i>Phosphor Code</i>
21	<i>Phosphor Equivalents List</i>

INTRODUCTION

This booklet contains a strange contrast of the latest, most exciting developments in display devices against the old-established, well-known tubes of the post-war era. Alongside ceramic envelope and fibre optic tubes, there are being produced Skiatron, or dark trace storage tubes, first developed for war-time radar sets. This underlines our double responsibility for advancing the state of the art at the fastest rate that technological expansion will permit, yet honouring the commitment to continue the supply of outmoded tubes, as long as there are sockets that require them.

R & D at Rank is presently directed towards higher resolution at low EHT for radar tubes; higher sensitivity with minimal length for instrument tubes; fibre optics for a host of display devices; rugged, ceramic envelopes for airborne tubes.

Wherever there is a new technique to be applied to C.R.T.'s, there is R.E.T.



Matricons

The Matricon is a display tube having a unique design of electron gun which generates multiple electron beams. Each beam can be individually modulated.

PRINCIPLES OF OPERATION

A diffused low velocity electron stream is directed towards a positive baffle plate containing a matrix of holes and from each hole emerges a fine beam of electrons. The envelope of beams then passes through a second plate having an identical matrix arrangement. This is a ceramic insulating plate with metal inserts in every hole, each of which is insulated from the others and controllable by an outside connection. At this point selective blanking takes place to form the required character or symbol. The selected beams pass through an accelerating field and are focused electromagnetically. Final positioning of the character on the screen is achieved with conventional deflection coils. Because the character is formed instantaneously, the electron density is high compared with other systems of character writing, resulting in a high Brightness \times Speed factor.




The standard matrix array is 7×5 , plus an additional hole which can be used for cursive writing or circular scan. This format can be used for all upper case characters, a very wide variety of symbols and all numerals. Where very high character quality is required alternative matrix layouts have been produced. For example, to produce upper and lower case characters a 14-hole in-line array is used and this is stepped into 10 positions electrically thereby simulating a 14×10 matrix.

CIRCUIT REQUIREMENTS

The Matricon can be regarded as a conventional cathode ray tube except that its grid is positively driven. A standing current of several milliamps is drawn from the cathode to the baffle plate, the d.c. voltage of which is between zero and +5 volts. The current contained in each beam is in the order of 20 microamps. Each beam can be controlled by a low swing of grid voltage. Typically the beam is cut off by -5 volts and fully driven by +25 volts. Transistor drive is therefore recommended.

The circuit engineer will appreciate that the Matricon represents a tremendous saving in character generation circuitry.

Matricons (Multiple Beam C.R.T.'s—Electromagnetic Focus and Deflection)

TYPE	BULB		Beam angle (degrees)	Overall Length (in.)	Number of Beams	TYPICAL OPERATING CONDITIONS				DESCRIPTION
	Size (in.)	Shape				Character size (in.)	V _{a1} (V)	V _{a2} (V)	V Screen (kV)	
M0436	4	O	38	42	36	0.05	150 to 250	1000 to 1500	15	Projection tube. Optically worked convex face for use with Schmidt systems. 7 × 5 + 1 matrix.
M0515A	5	O	70	24	15	0.04	50 to 100	150 to 200	15	Image Reduction employed. Line Matricon.
M0515B	5	O	70	19	15	0.11	50 to 100	150 to 200	15	Image Reduction employed. Line Matricon.
M0536	5	O	70	19	36	0.08	50 to 100	150 to 200	15	Image Reduction employed. 7 × 5 + 1 matrix.
M0715F	7	O	60	28	15	0.10	150 to 250	1000 to 1500	15	Line Matricon. Flat face
M0831	8		70	23	31	0.14	150 to 250	1000 to 1500	15	Double-Line-Plus-One matrix.
M0936	9	O	55	28	36	0.15	150 to 250	1000 to 1500	15	7 × 5 + 1 matrix.
M0936F	9	O	70	26	36	0.10	150 to 250	1000 to 1500	15	Flat face. 7 × 5 + 1 matrix.
M1236A	12	O	55	32	36	0.18	150 to 250	1000 to 1500	15	7 × 5 + 1 matrix.
M1236B	12	O	55	25	36	0.30	50 to 100	150 to 200	15	Dimensionally similar to CV6113. Image Reduction employed. 7 × 5 + 1 matrix.
M1936	19		90	26	36	0.25	150 to 250	1000 to 1500	15	7 × 5 + 1 matrix.
M2336	23		90	28	36	0.25	150 to 250	1000 to 1500	15	7 × 5 + 1 matrix.

GENERAL: Heaters 6.3V, 0.7A.
 Flying Lead Base on all tubes.
 Grid drive for full brightness +25V. For cut-off -5V max.
 Baffle voltage 0 to +5V (w.r.t. Cathode) at 25mA.
 Helix resistance 300 M Ω.
 Phosphor to customer's requirements.

