

# DRAWING THE LINE

2<sup>ND</sup> EDITION

TECHNICAL HAND DRAFTING  
FOR FILM AND TELEVISION

DAVID M<sup>C</sup>HENRY

Praise for the First Edition

"When David worked with us on *Game of Thrones*, I was impressed by his enthusiasm and extensive knowledge of architecture. He is a fine draughtsman and teacher, and I believe this book will prove invaluable to those wishing to improve their skills at the drawing board."

*Paul Ghirardani,  
Five-Time Emmy Award Winner, Supervising Art Director, GAME OF THRONES*

"This excellent book both celebrates and helps to perpetuate the unique skills of hand-drawn orthographic construction draughting for film and television set building. David McHenry's drawings have a beautiful pictorial quality which, through his sensitive use of line, communicate technical and artistic information. The book is a useful introduction to both students and professionals in the Art Department. A winner!"

*Professor Moira Tait,  
Production Designer and Tutor; Member of BAFTA,  
Fellow of The Royal Society of Arts*

"My only flaw with *Drawing the Line* is that I didn't have it when I was in high school or college. It is a must have for up and coming designers. This book merely consolidates how seamlessly his drawings simply and elegantly enhance the designer's vision."

*Jon Gary Steele,  
Production Designer, SANDMAN (2022), OUTLANDER (2014-20), and LUTHER (2023)*



Taylor & Francis

Taylor & Francis Group

<http://taylorandfrancis.com>

# DRAWING THE LINE

This is the definitive guide for all aspects of scenic hand drafting for film and television, now comprehensively updated and revised for its second edition. Author, David McHenry, utilizes 45 years of experience as a Designer, Art Director, Storyboard Artist, and Draftsman to provide readers with an accessible step-by-step guide of professional techniques, tools, and workflows.

Readers will discover how to draw the iconic scroll of a classical column or learn the difference between Flemish and English bond brickwork, as well as all four types of drafting projection in detail: isometric, oblique, orthographic, and axonometric. Also included is hard-to-find information on lens angles and their calculation for different screen aspect ratios, how to create a lens projection image of a set with a given lens, height, and aspect ratio, and how to create forced perspective. Beautifully illustrated with carefully crafted hand-drawn illustrations on every page, this thoroughly revised text has been updated to include new examples and exercises and a revised glossary, making it the ideal step-by-step guide to hand drafting for film and television.

This is an essential resource for students of drafting for film and television, scenic design, and art direction courses. It will also hugely benefit professionals studying or working in film and television design.

David McHenry studied Theatre Design in London at the Central School of Art and Design and has worked in Theatre, Television, and Film for over 45 years as Designer, Art Director, Storyboard Artist, Draftsman, and Lecturer. His recent drafting credits include Ridley Scott's *NAPOLEON* and Neil Gaiman's *SANDMAN*. He has taught at the University of the Arts (Wimbledon), the London Film School, the National Film School (Beaconsfield and Scotland), Nottingham Trent University, the National Film School (Lillehammer Norway), the Film School (Bergen Norway), and the Stockholm University of the Arts (Sweden).



Taylor & Francis

Taylor & Francis Group

<http://taylorandfrancis.com>

# DRAWING THE LINE

TECHNICAL HAND DRAFTING  
FOR FILM AND TELEVISION

2<sup>ND</sup> EDITION

DAVID MCHENRY

 **Routledge**  
Taylor & Francis Group  
NEW YORK AND LONDON

Designed cover image: David McHenry

Second edition published 2024  
by Routledge  
605 Third Avenue, New York, NY 10158

and by Routledge  
4 Park Square, Milton Park, Abingdon, Oxon, OX14 4RN

Routledge is an imprint of the Taylor & Francis Group, an informa business

© 2024 David McHenry

The right of David McHenry to be identified as author of this work has been asserted in accordance with sections 77 and 78 of the Copyright, Designs and Patents Act 1988.

All rights reserved. No part of this book may be reprinted or reproduced or utilised in any form or by any electronic, mechanical, or other means, now known or hereafter invented, including photocopying and recording, or in any information storage or retrieval system, without permission in writing from the publishers.

Trademark notice: Product or corporate names may be trademarks or registered trademarks and are used only for identification and explanation without intent to infringe.

First edition published by Routledge 2018

Library of Congress Cataloging-in-Publication Data

Names: McHenry, David, author.

Title: Drawing the line : technical hand drafting for film and television /  
David McHenry.

Description: Second edition. | New York : Routledge, 2024. | Includes  
index.

Identifiers: LCCN 2023026822 (print) | LCCN 2023026823 (ebook) | ISBN  
9781032277622 (hardback) | ISBN 9781003293972 (ebook)

Subjects: LCSH: Mechanical drawing--Technique. | Theaters--Stage-setting  
and scenery.

Classification: LCC T357 .M33 2024 (print) | LCC T357 (ebook) | DDC  
777--dc23/eng/20230607

LC record available at <https://lcn.loc.gov/2023026822>

LC ebook record available at <https://lcn.loc.gov/2023026823>

ISBN: 9781032277622 (hbk)

ISBN: 9781032277608 (pbk)

ISBN: 9781003293972 (ebk)

DOI: 10.4324/9781003293972

Publisher's Note

This book has been prepared from camera-ready copy provided by the author.

## CONTENTS

INTRODUCTION AND ACKNOWLEDGEMENTS.....	ix
EQUIPMENT - THE BASICS.....	1
SCALE.....	5
PLAN.....	9
REFLECTED CEILING PLAN.....	25
LAYING OUT THE PAGE.....	27
PRACTICAL DRAFTING EXERCISES.....	31
LETTERING & LABELLING.....	37
THE TITLE BLOCK.....	39
PAPER SIZES.....	40
FOLDING DRAWINGS.....	41
TRIANGLES.....	45
THE CIRCLE.....	46
DIVIDING A LINE INTO EQUAL PARTS.....	47
POLAR POINT.....	49
THE ARCH.....	50
DOORS.....	63
WINDOWS.....	72
STAIRCASES.....	81
BRICKS.....	93
STONEMWORK.....	96
MOULDINGS.....	98
ISOMETRIC PROJECTION.....	104
AXONOMETRIC PROJECTION.....	105
OBLIQUE.....	106
PROJECTION OF CIRCLES.....	107
PERSPECTIVE GRID.....	108
DEVELOPMENT OF TRUE SHAPES.....	119
SETTING UP A CAMERA PROJECTION.....	125
REFLECTIONS IN A MIRROR.....	147
BACKINGS - CALCULATING SIZE.....	150
FORCED PERSPECTIVE.....	154
THE CLASSICAL ORDERS.....	160
ENTASIS.....	168
IONIC VOLUTE.....	170
THE SPIRAL - HELIX.....	174
SURVEYING.....	175
GLOSSARY.....	183
INDEX.....	204



Taylor & Francis

Taylor & Francis Group

<http://taylorandfrancis.com>

This is a Manual, a Textbook, and a Reference book combined.

It is for students of Film and Television Design and those starting out in the Art Department.

There are no long pages of text and written explanations here, only diagrams and drawings with brief concise notes.

With enormous thanks to Alby Bailey for her help, advice, and exceptional talent in preparing this Second Edition, to Caroline Kane for her assistance, and to Maureen for her endless encouragement.



Taylor & Francis

Taylor & Francis Group

<http://taylorandfrancis.com>

Dedicated to  
Ted McHenry, my father.



Taylor & Francis

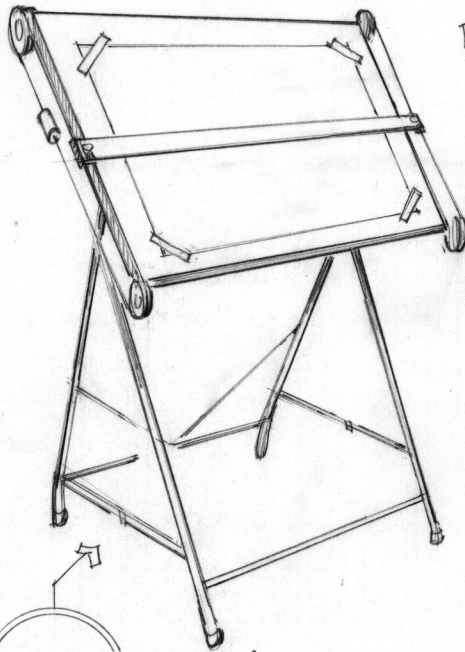
Taylor & Francis Group

<http://taylorandfrancis.com>

# EQUIPMENT - THE BASICS

PLASTIC COATED BOARDS [MELAMINE] ARE TOO UNFORGIVING TO DRAW ON.  
DRAFTING MATS ARE NECESSARY BUT WHITE MOUNT CARD IS A GOOD SUBSTITUTE

PARALLEL MOTION  
DRAWING BOARDS



FLOOR STANDING

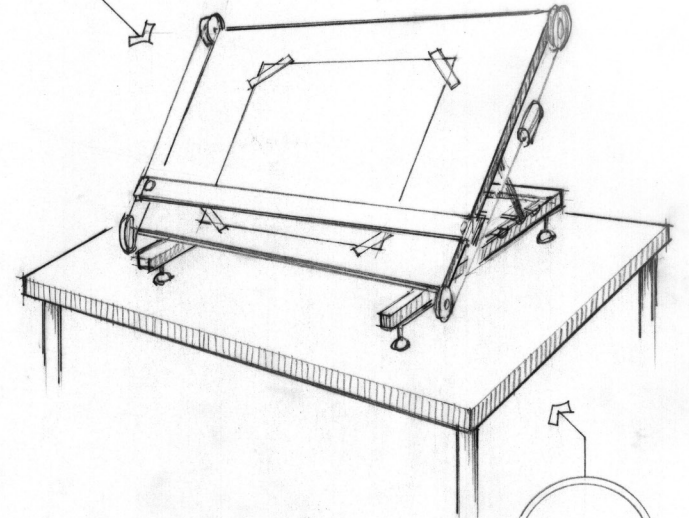
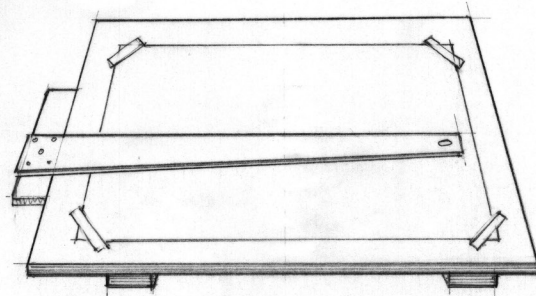
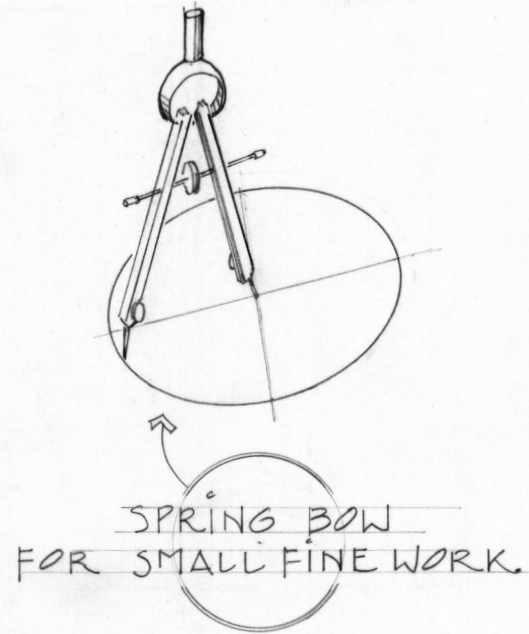
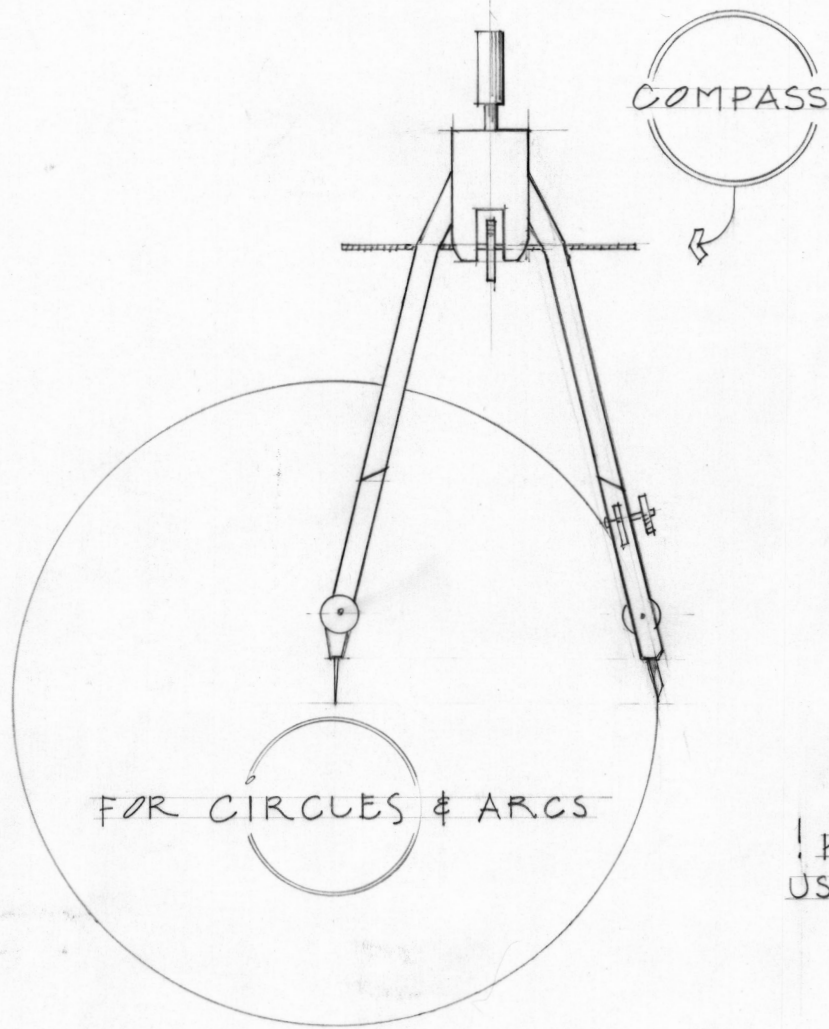


TABLE TOP

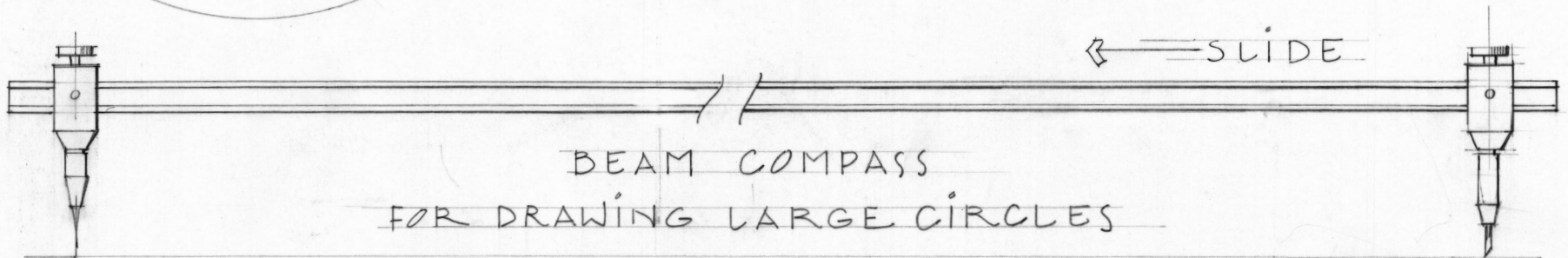


"THE ORIGINAL"  
WITH 'T' SQUARE

# EQUIPMENT - THE BASICS



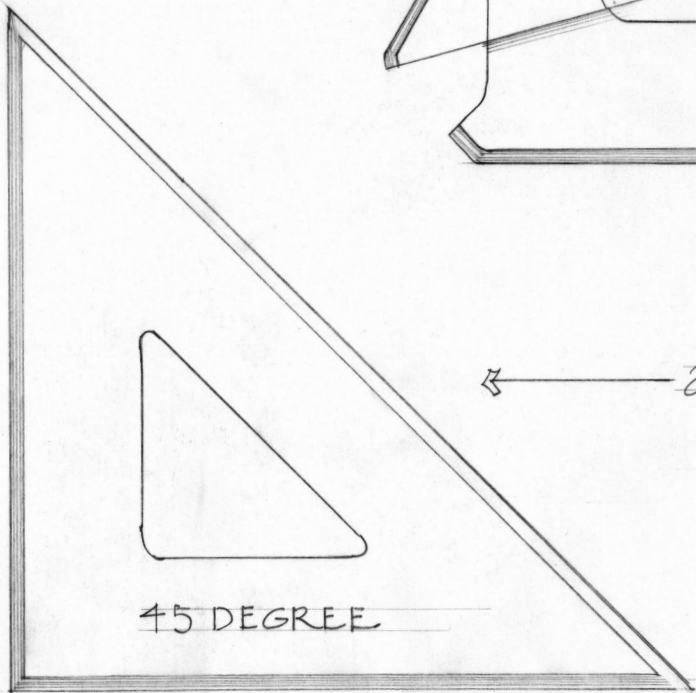
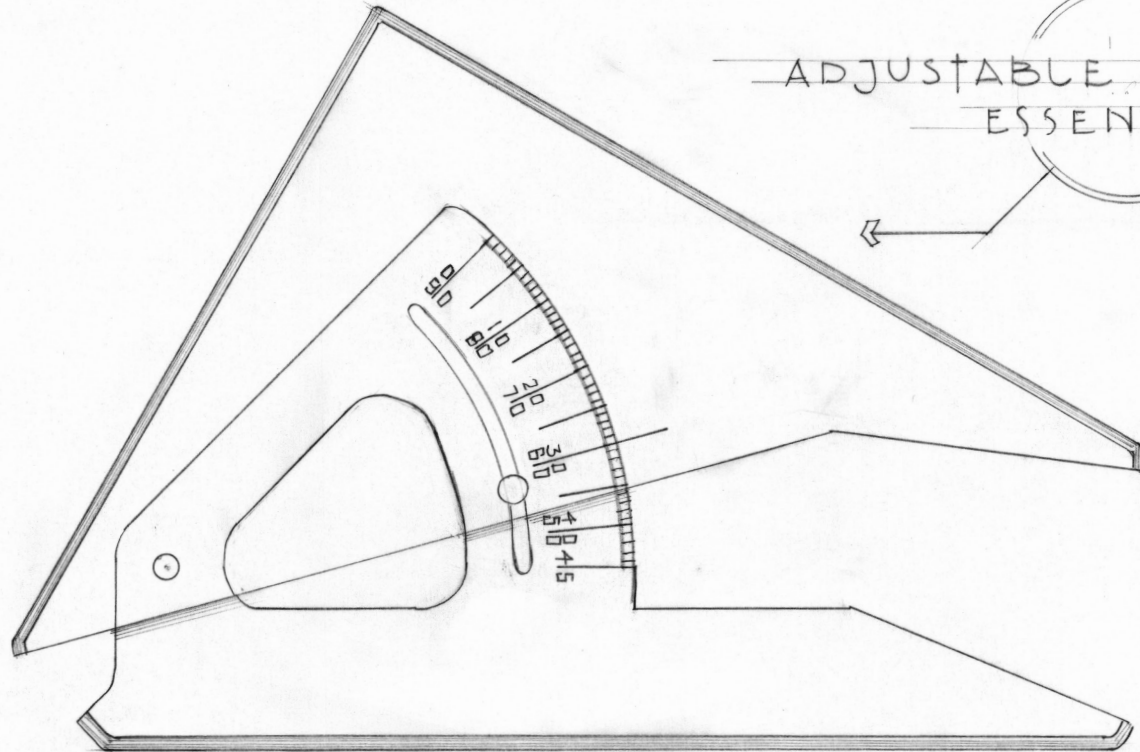
! KEEP LEADS SHARP!  
USE AN EMERY BOARD



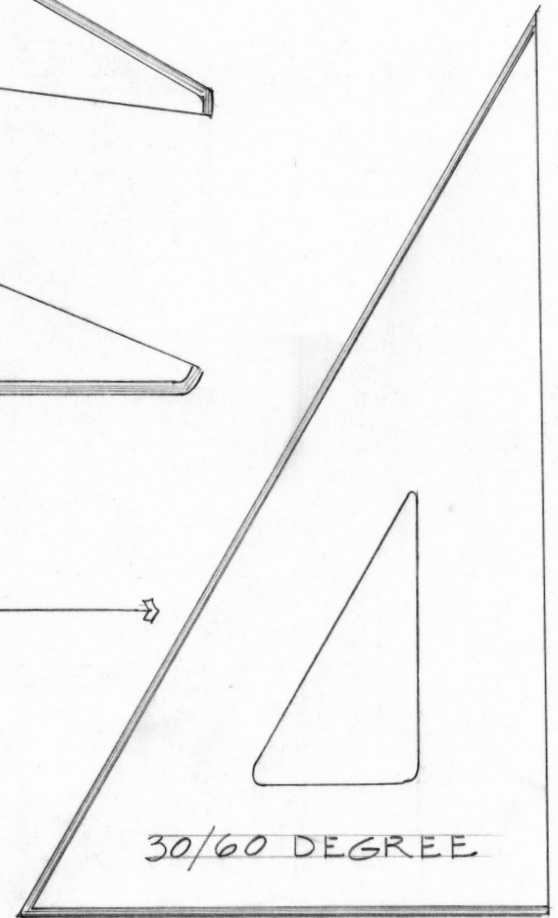
# EQUIPMENT - THE BASICS

3

ADJUSTABLE SET SQUARE  
ESSENTIAL!



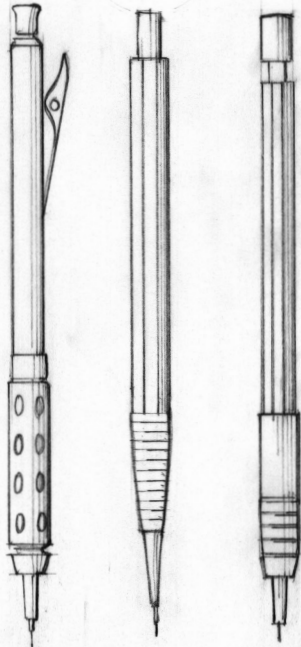
2 USEFUL SET SQUARES



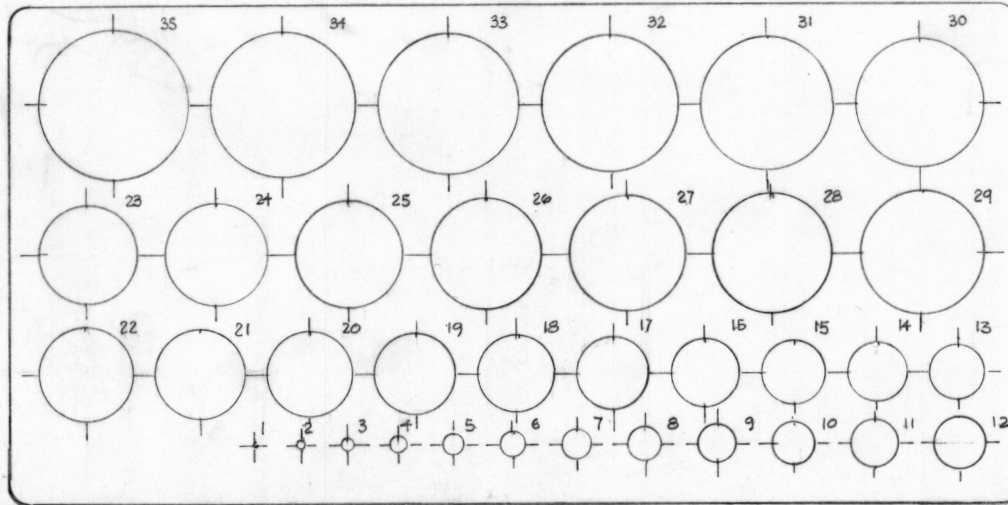
# EQUIPMENT - THE BASICS

4

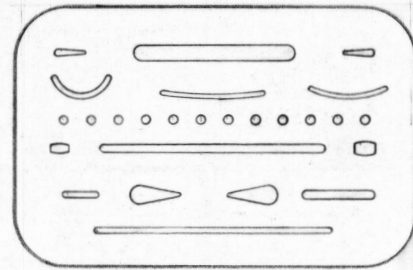
MECHANICAL PENCILS



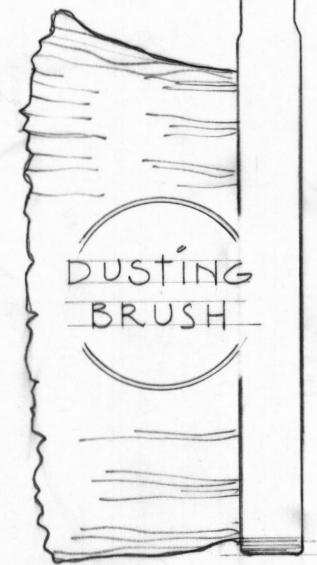
- 0.5 PENCIL FOR BASIC WORK
- 0.3 PENCIL FOR FINE DETAIL
- 0.9 PENCIL FOR OUTLINES ETC.



STENCIL TEMPLATE [S]



ERASER SHIELD



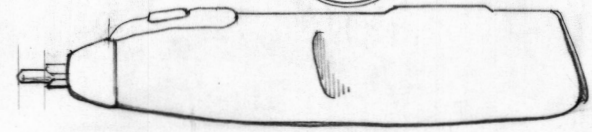
DUSTING BRUSH



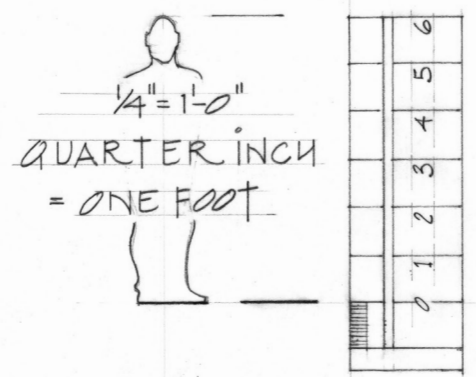
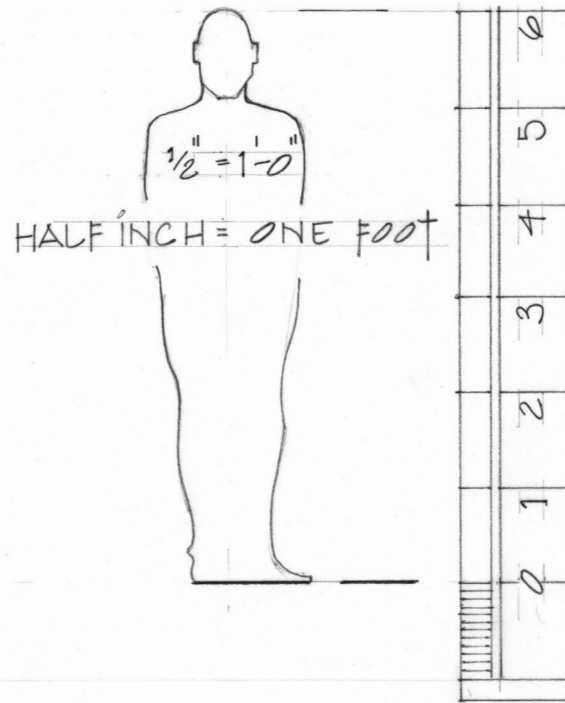
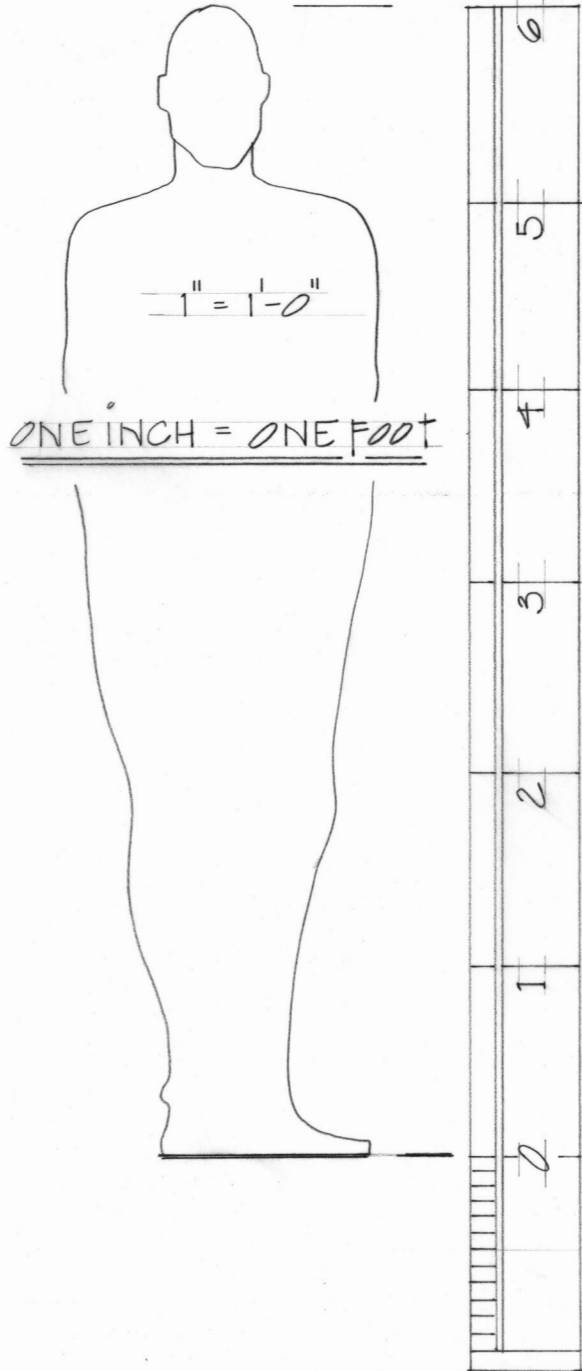
REFILL ERASER PENCIL



BATTERY POWERED ERASER



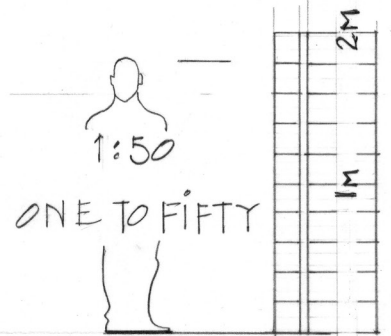
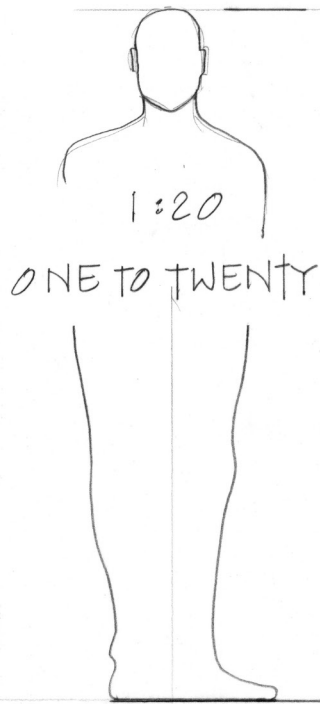
# SCALE : IMPERIAL [U.S.]



SCALE :



METRIC

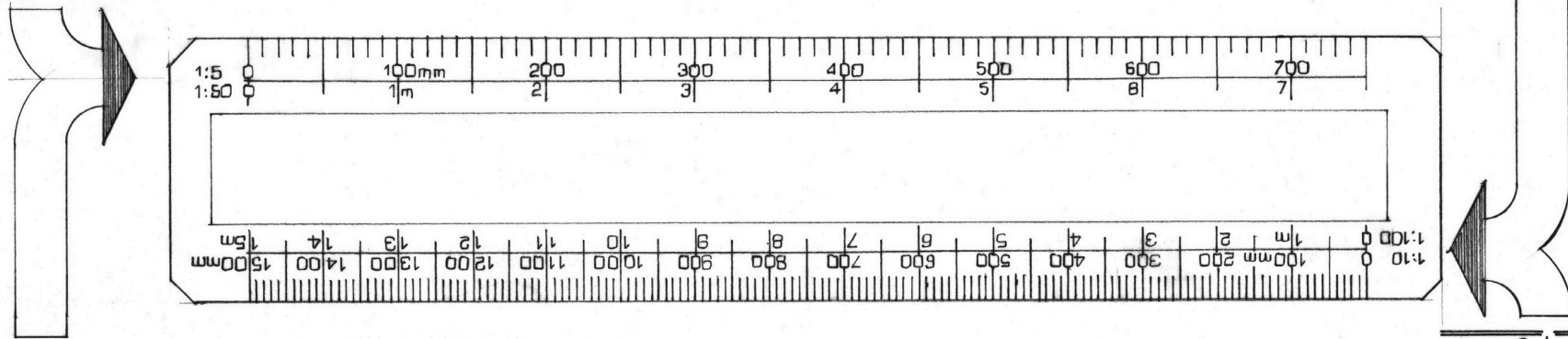


# USING A SCALE RULER [METRIC]

METRES, CENTIMETRES AND MILLIMETRES  
MOST USED MEASURING SYSTEM IN THE WORLD

TOP ROW = 1:5 [ONE TO FIVE]  
READS LEFT TO RIGHT  
START AT ZERO

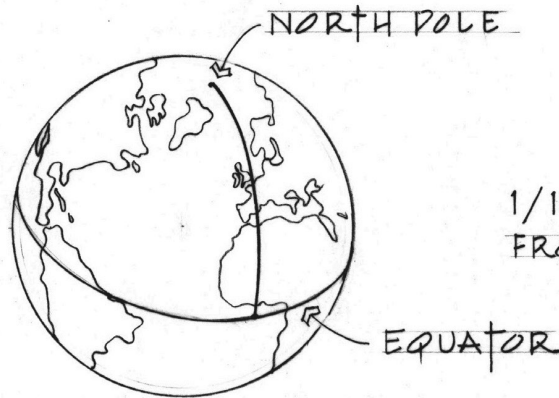
BOTTOM ROW = 1:100 [ONE TO HUNDRED]  
READS LEFT TO RIGHT  
START AT ZERO



BOTTOM ROW = 1:50 [ONE TO FIFTY]  
READS LEFT TO RIGHT  
START AT ZERO

TOP ROW = 1:10 [ONE TO TEN]  
READS LEFT TO RIGHT  
START AT ZERO

METRIC SYSTEM OF MEASUREMENT  
BASED ON A QUADRANT OF  
THE EARTH'S MERIDIAN



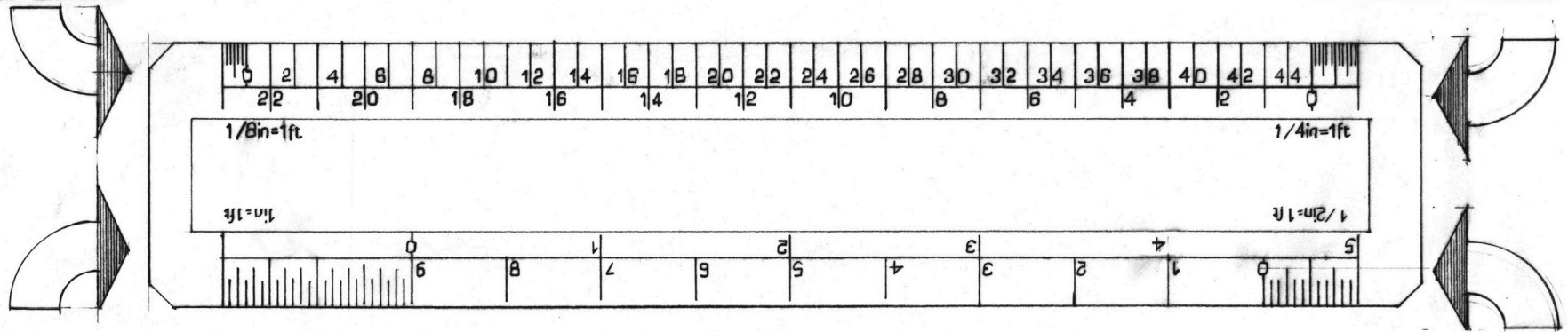
ONE METRE IS EQUAL TO:  
 $1/10,000,000^{\text{TH}}$  OF THE DISTANCE  
FROM THE NORTH POLE TO EQUATOR

# USING A SCALE RULER [IMPERIAL]

IMPERIAL [FEET AND INCHES] USED IN U.S.A.

TOP ROW =  $\frac{1}{8}'' = 1-0''$   
 READS LEFT TO RIGHT  
START AT ZERO

BOTTOM ROW =  $\frac{1}{4}'' = 1-0''$   
 READS RIGHT TO LEFT  
START AT ZERO



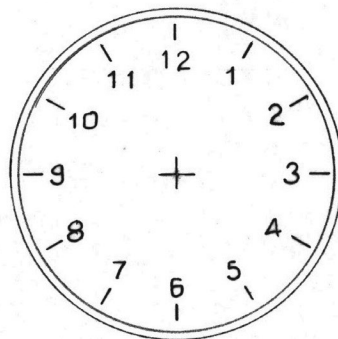
START AT ZERO  
 READS RIGHT TO LEFT  
 BOTTOM ROW =  $\frac{1}{2}'' = 1-0''$

START AT ZERO  
 READS LEFT TO RIGHT  
 TOP ROW =  $\frac{1}{2}'' = 1-0''$

## UNDERSTANDING IMPERIAL

A BASE 12 NUMBER SYSTEM

A CLOCK-FACE = 12 DIVISIONS [INCHES]



12 INCHES = ONE FOOT [  $12'' = 1-0''$  ]

1 HOUR = ONE FOOT

3 O'CLOCK = 3"

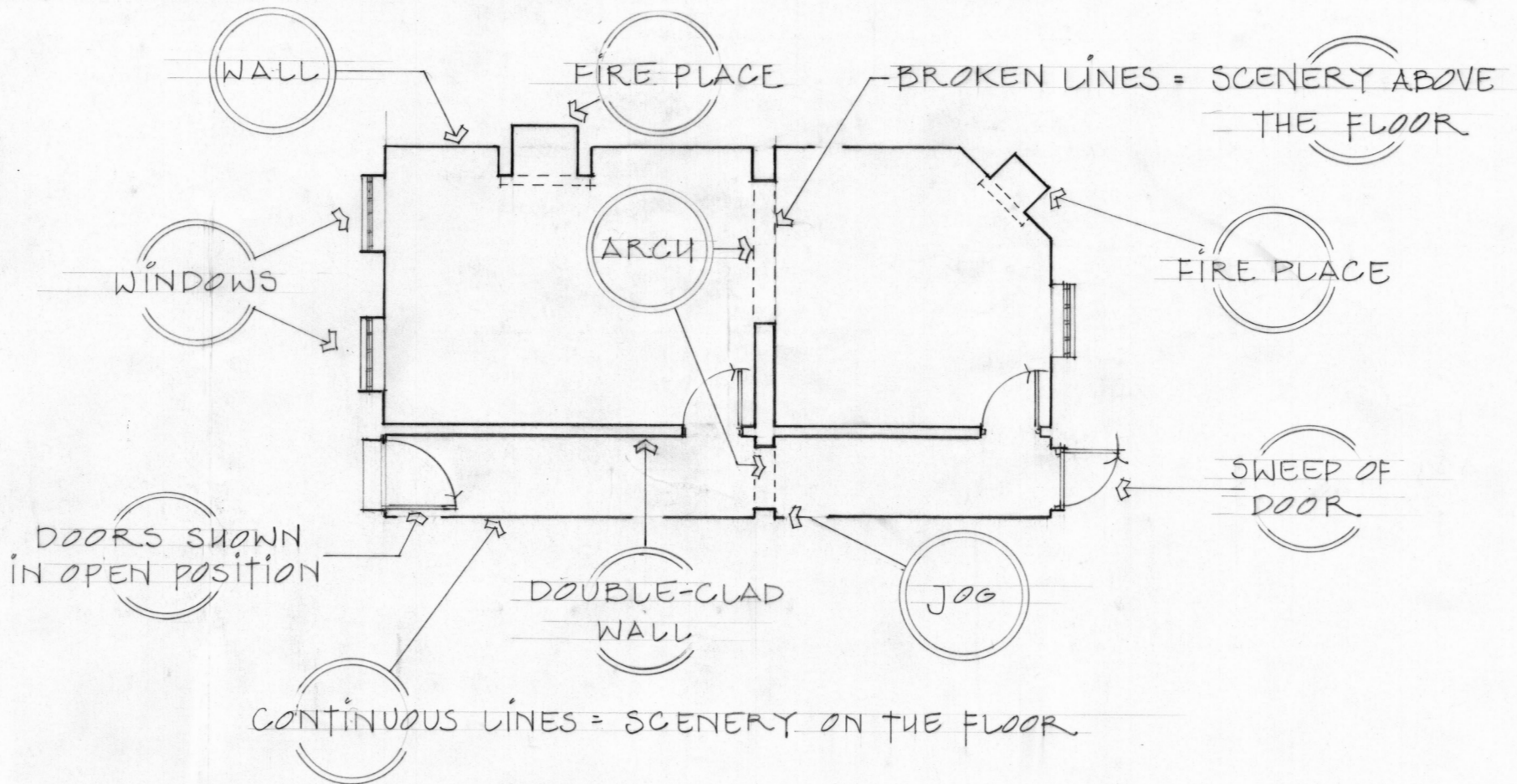
6 O'CLOCK = 6" ETC.

# THE PLAN

THE PLAN IS LIKE A MAP - A BIRDS EYE VIEW

"THE PLAN IS THE GENERATOR" - LE CORBUSIER

THE PLAN IS THE FOOTPRINT WHERE THE SET MEETS THE STAGE FLOOR



THE PLAN IS AN IMAGINARY HORIZONTAL SLICE THAT CUTS THE SET AT CONVENTIONALLY 1.0 METRE OR 3'-0" ABOVE THE FLOOR