

The background of the slide is a dark blue color. It features several sets of concentric circles in a lighter blue shade. These circles are arranged in a way that they overlap each other, creating a complex, geometric pattern. The circles are centered around the text, with some overlapping the text itself.

Maneuvering Boards 101

by

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Understanding Motion

True Motion

Movement pertaining to a change of position in relation to a fixed reference point on the Earth

Relative Motion

Movement relative to a selected object in relation to your own ship.

Labeling your Plot

- E- (*Earth*) Center
- E R - Your Vector
- R M - Relative motion line
- E M - (*Them*) The other vessels vector
- R M L – Relative motion line
- Remember: Vectors always represent speed

Scales

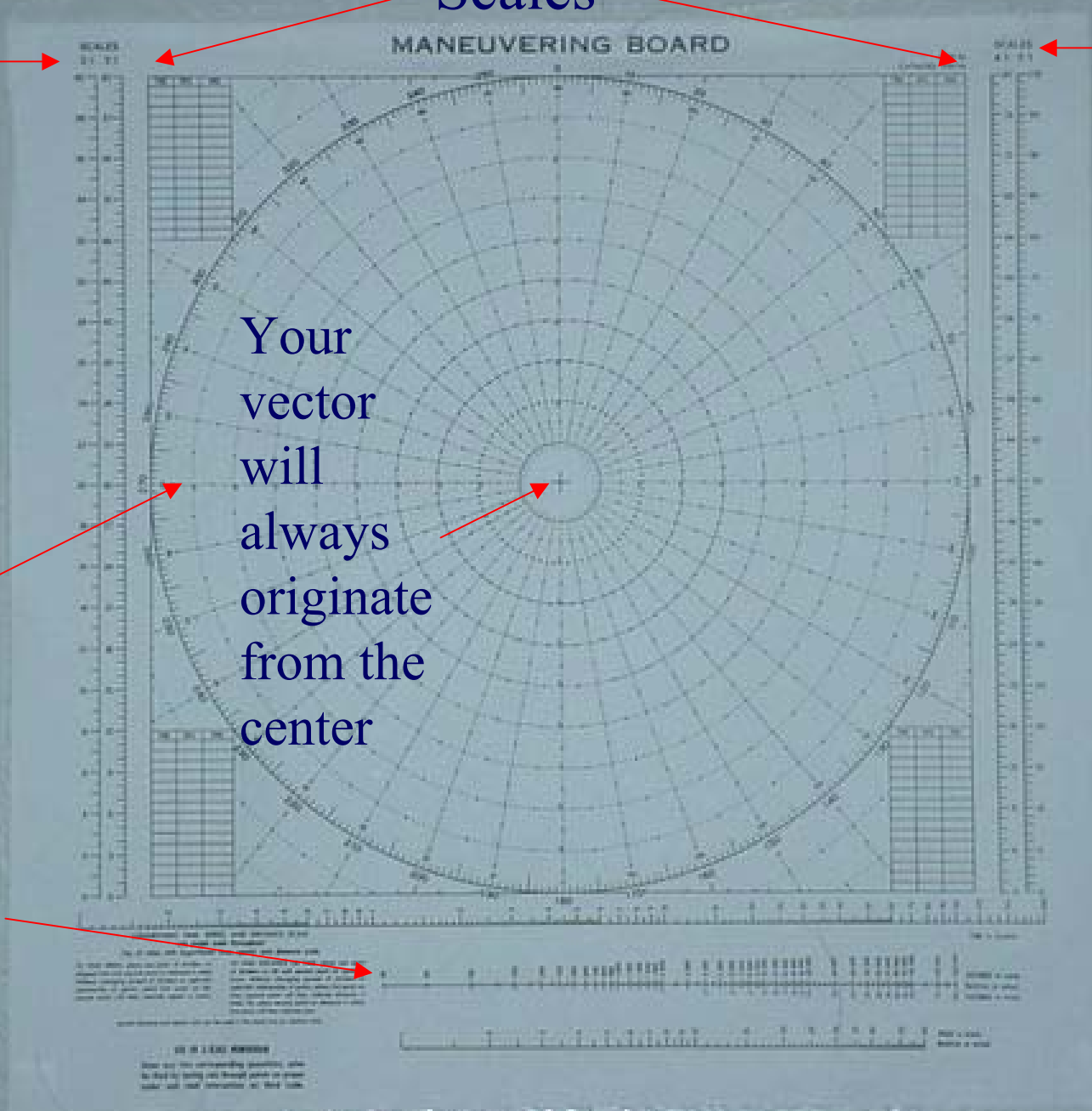
Use for
Distance
(2:1)

Note:
using the
scale on
the MB
can also
be used
(1:1).

Use for
speed
(5:1)

Your
vector
will
always
originate
from the
center

Logarithmic
scale



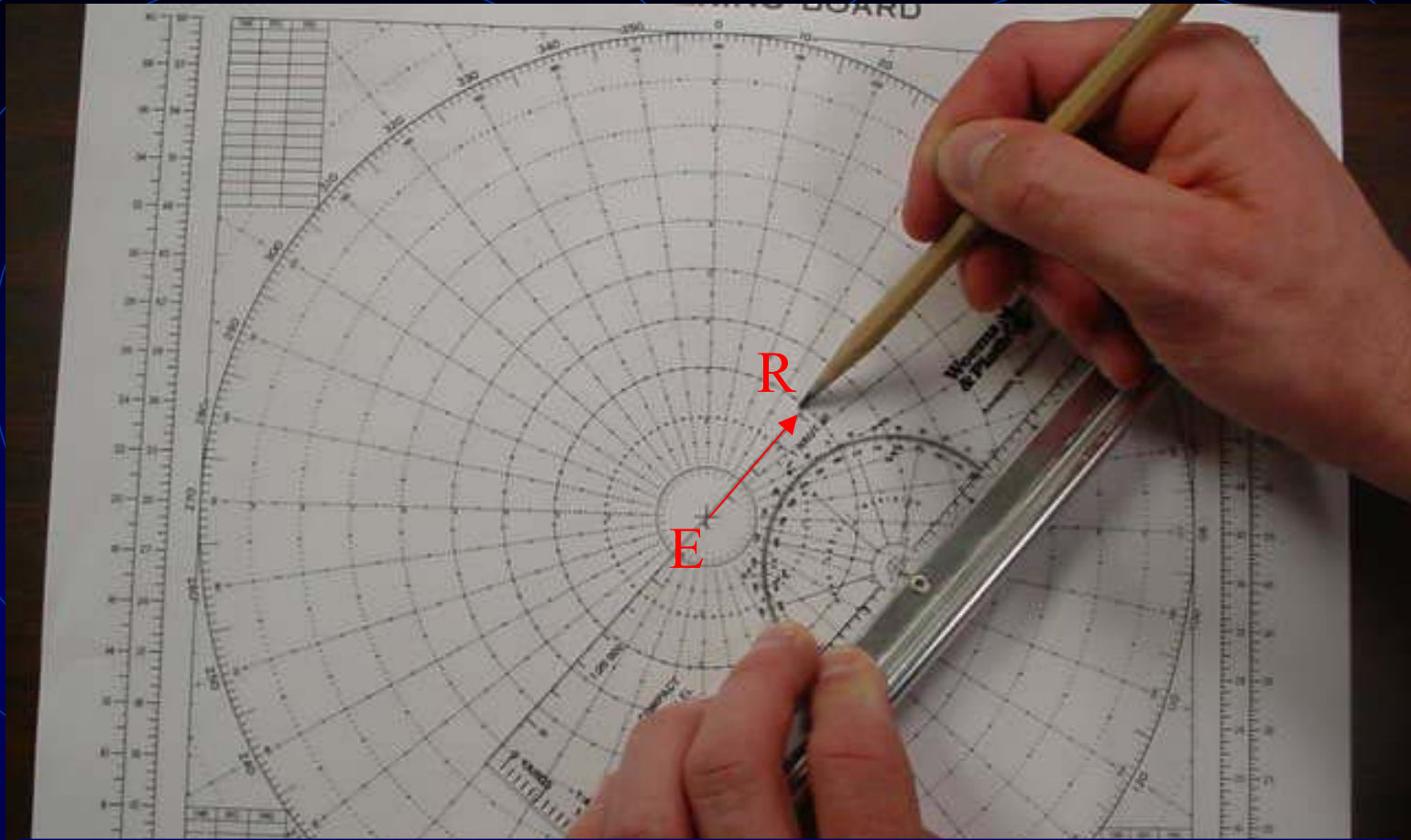
Supplies needed

- Active radar capable of supplying ranges and bearings of another vessel
- Maneuvering Board
- Pencil
- Divider
- Compact parallel plotter

Exercise #1

OS (own ship) course: 040' True

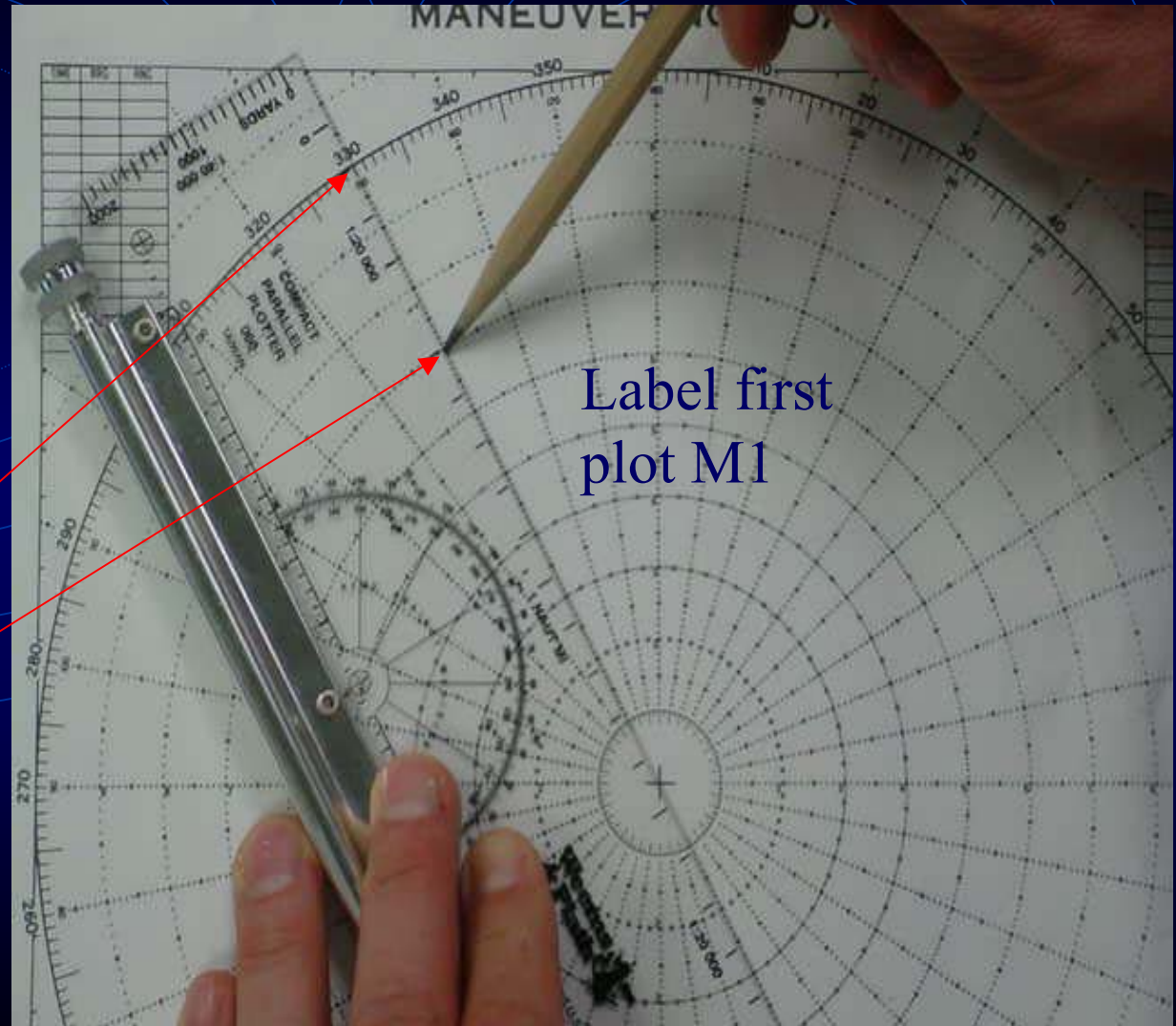
OS Speed: 15 knots



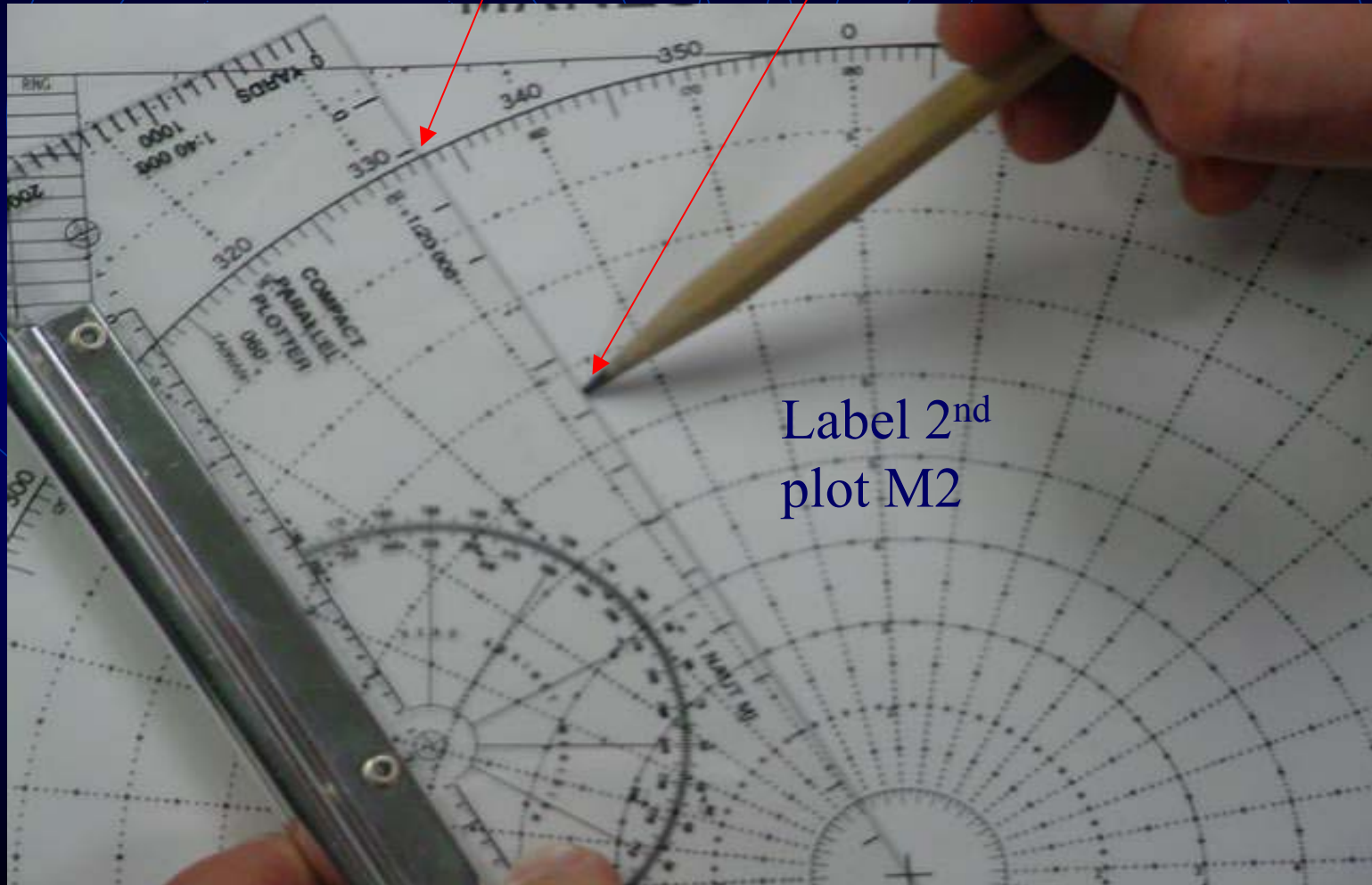
Next, use your parallel plotter and from the center, draw your vector at 040'T. Remember, the length of the vector is your ships speed (15 kts). This becomes E to R.

Plotting your contact vessel

You should try
To plot at least
3 fixes for your
Contact vessel.
One plot every
3 minutes. Our
First plot will
Be at 330'T,
Range- 7NM
**Use the 1:1 range
scale**

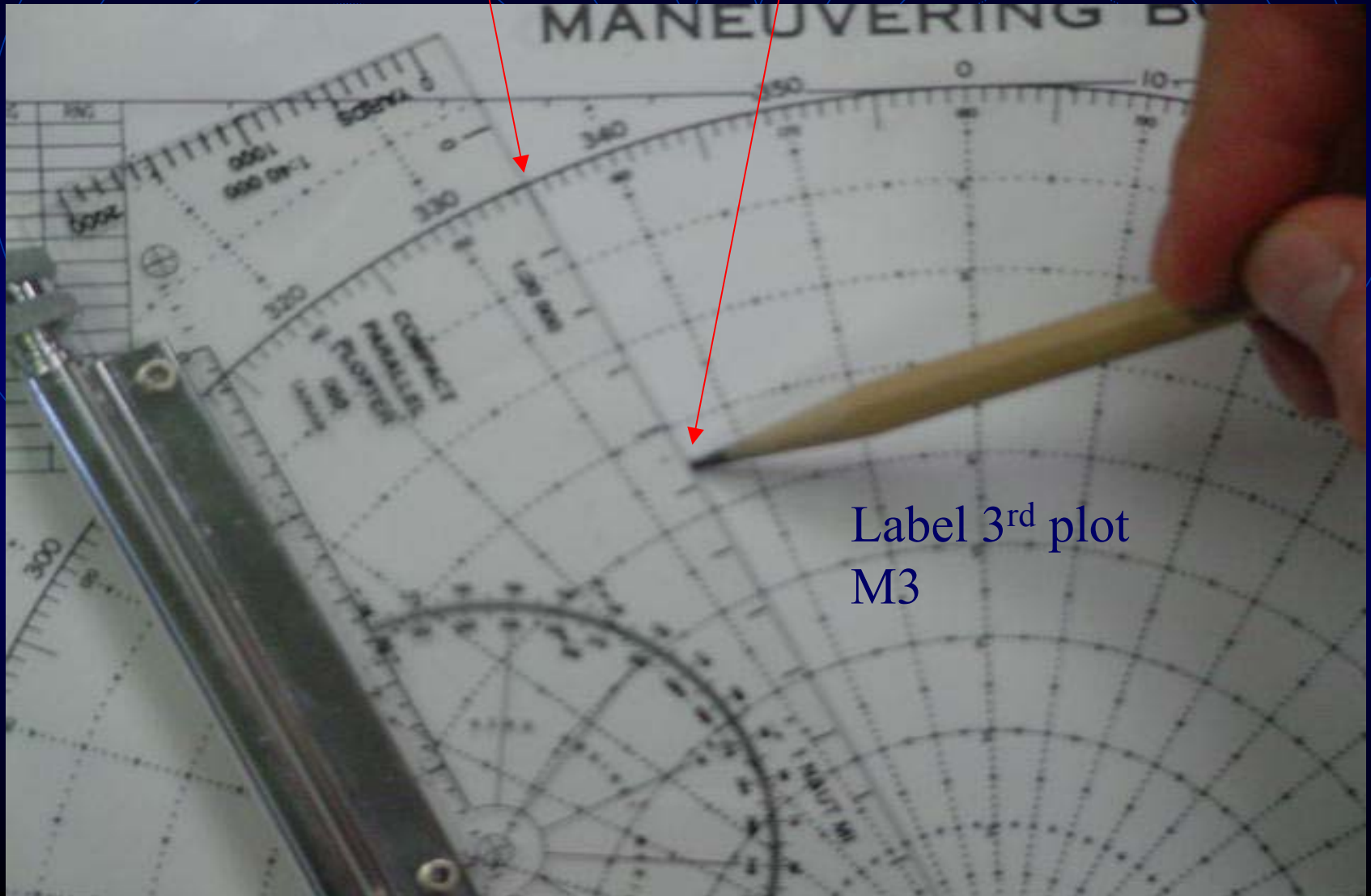


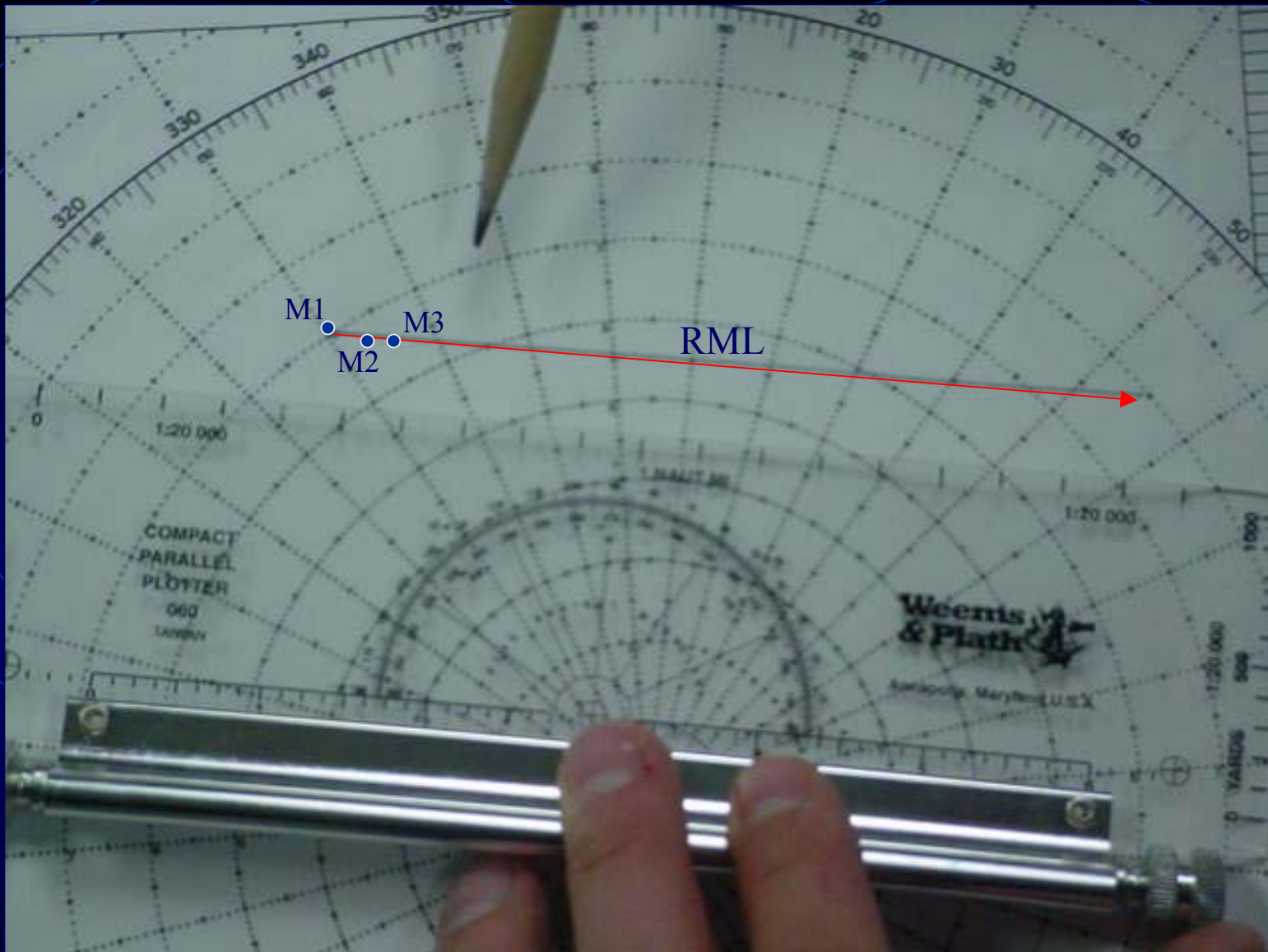
3 minutes later, we plot
our contact vessel at
333'T, range 6.7 nm



Label 2nd
plot M2

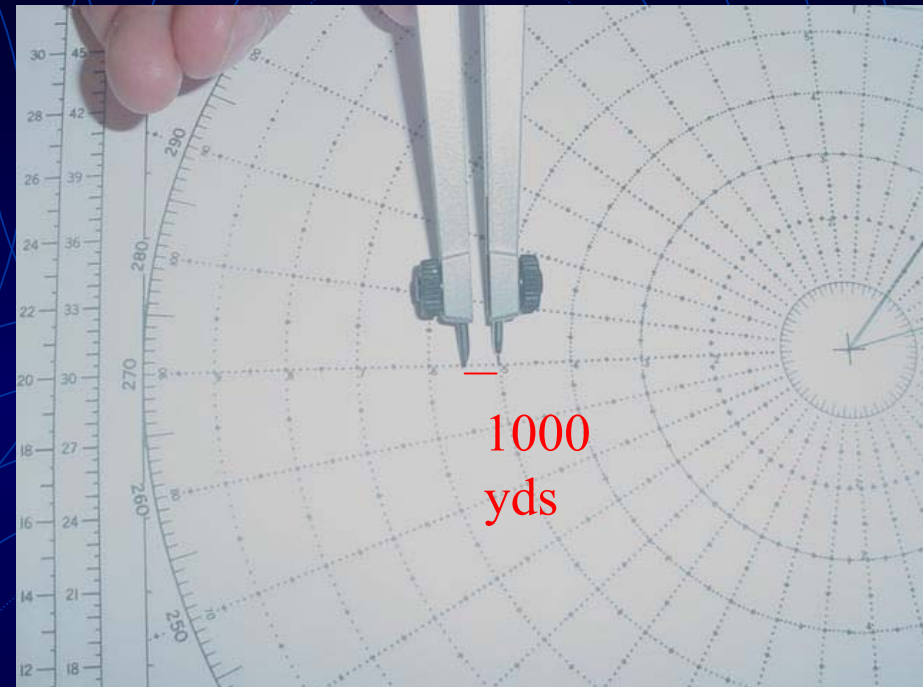
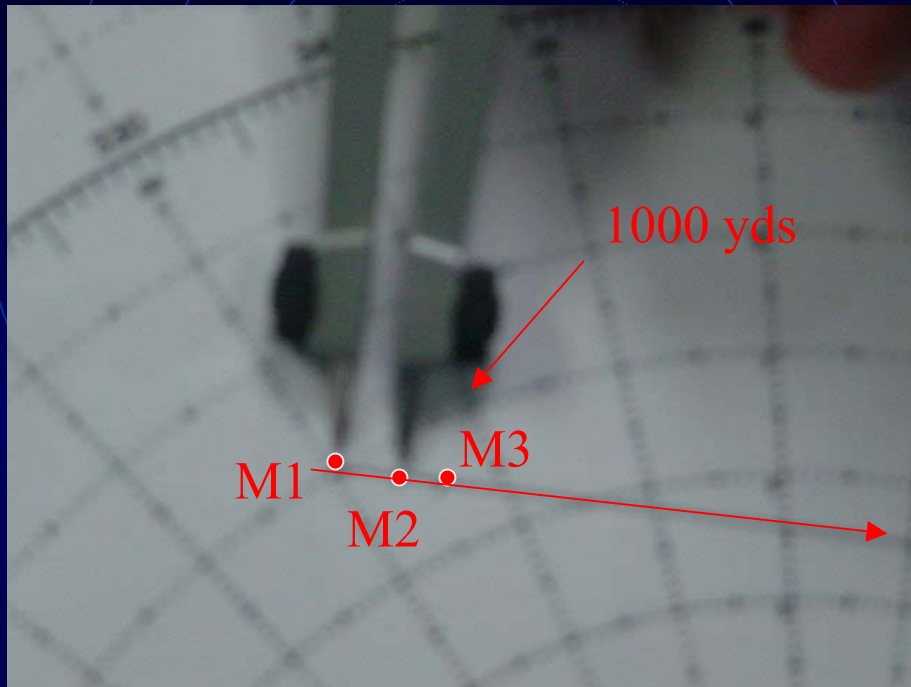
3 minutes later, we plot
our contact vessel at
335'T, range 6.5 nm



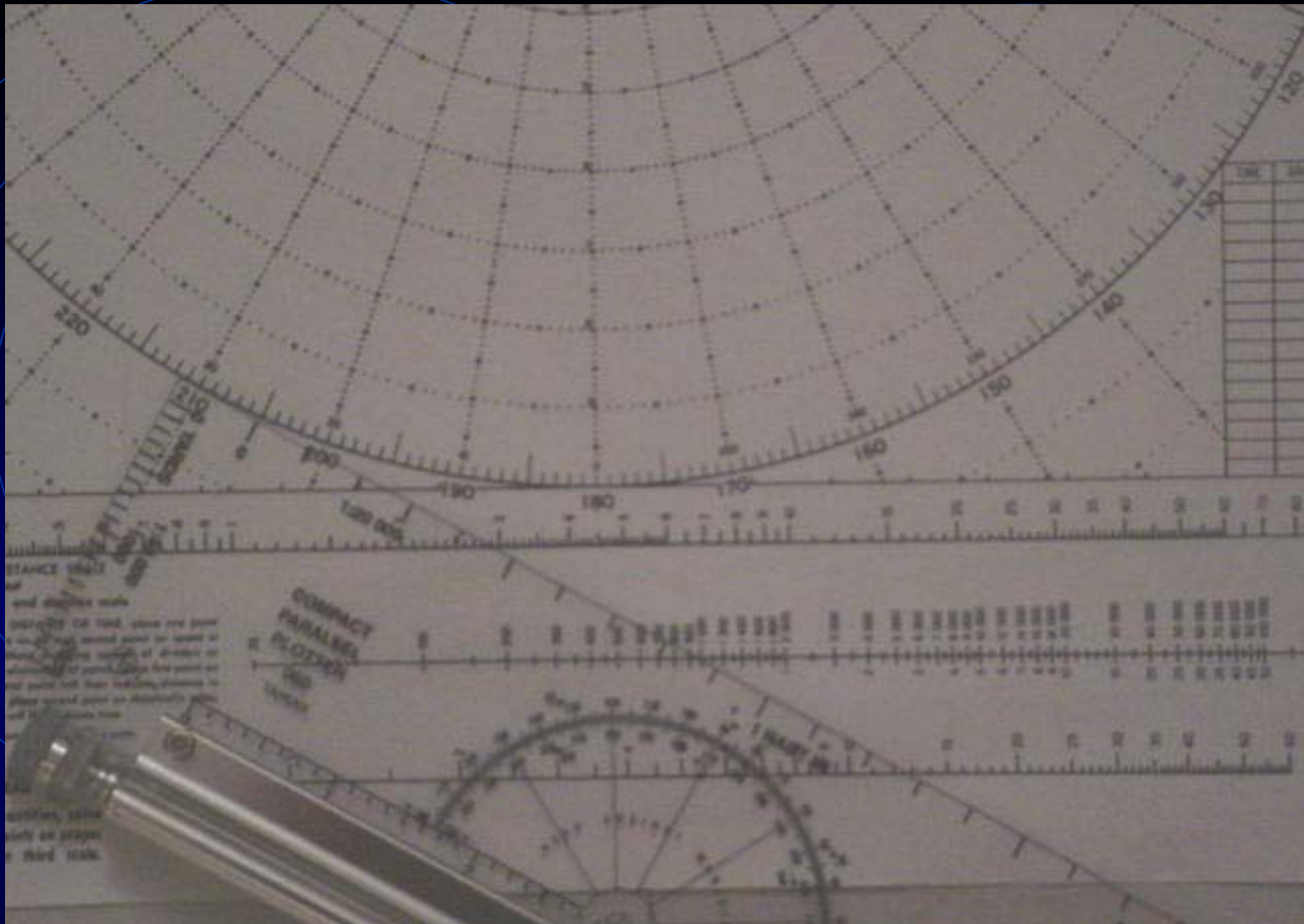


Now you have 3 points to draw your RML (Relative motion line).

Determining Speed of Relative Motion (SRM)

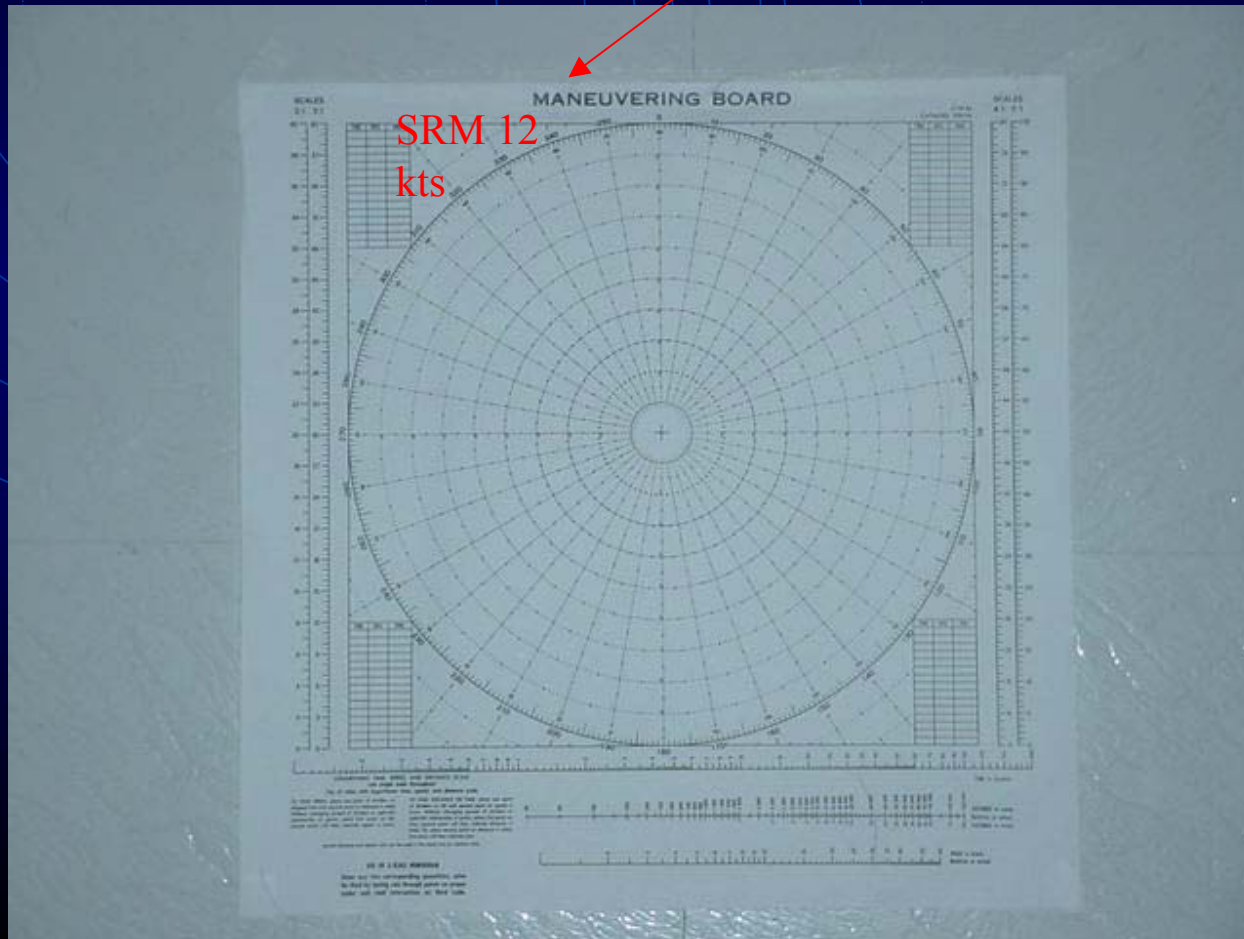


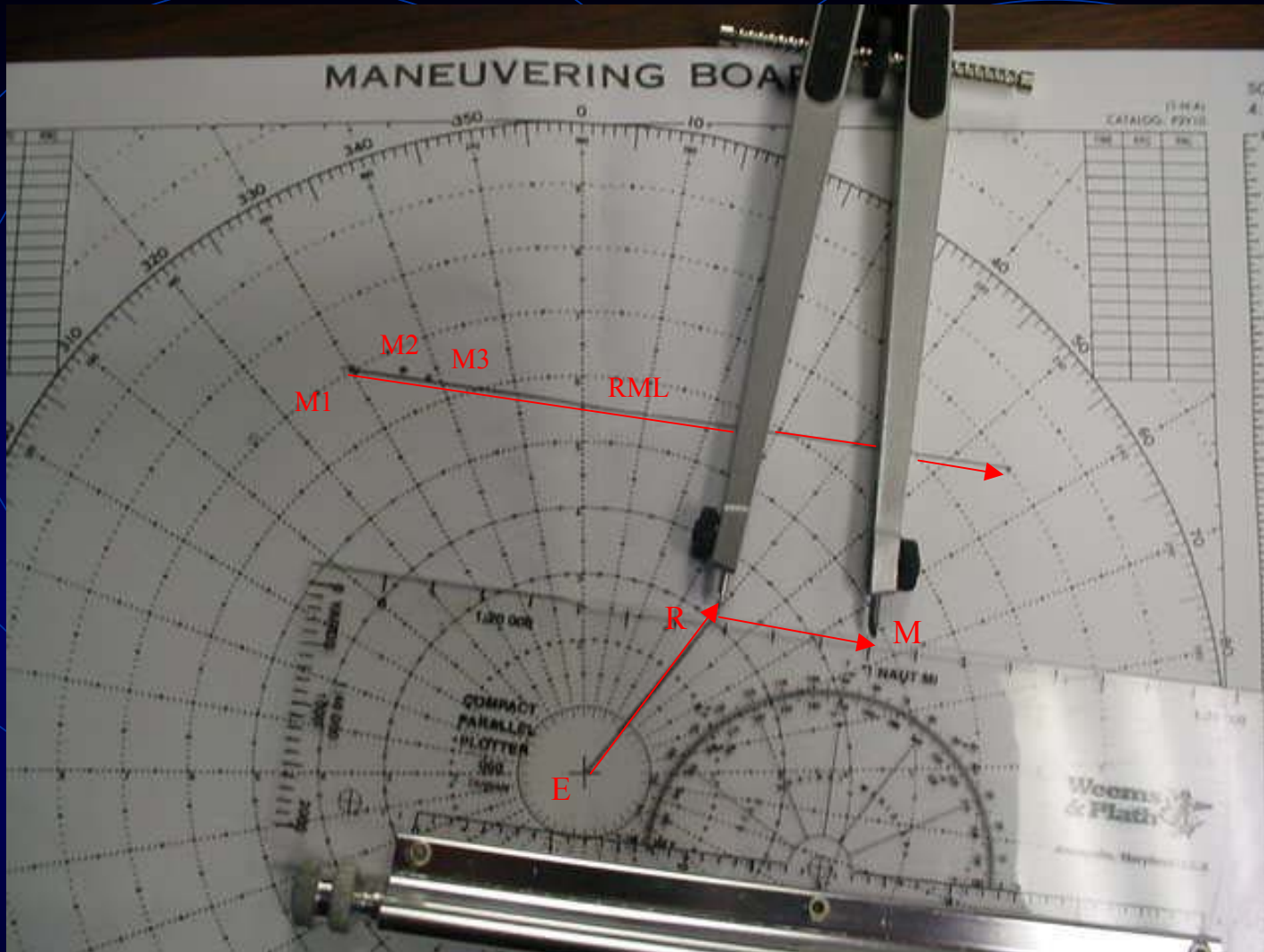
To determine the target vessels SRM, measure the distance between two of your plots. You should use all 3 plots unless there is a large difference between them. If this is the case, use the most recent two. Next, go to the logarithmic scale at the bottom of the board.



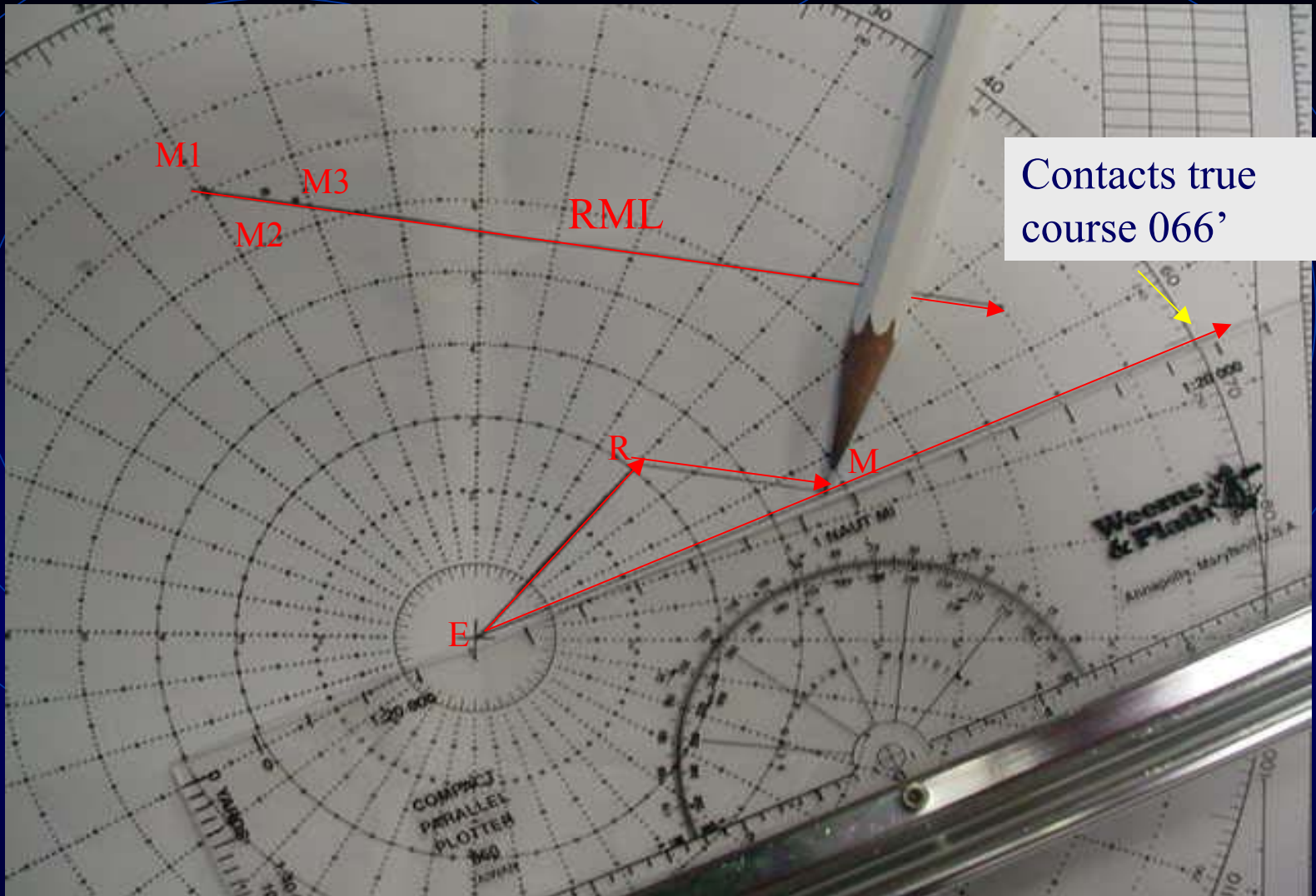
You know that your time between plots was 3 min & your distance was 1,000 yards. Now, line up the parallel plotter between the 2 points and you get a **SRM** of 12 knots.

Remember that you just figured out Speed of relative motion, not true speed. Don't confuse the two or it will affect your final plot. Write down the SRM somewhere on your plot.

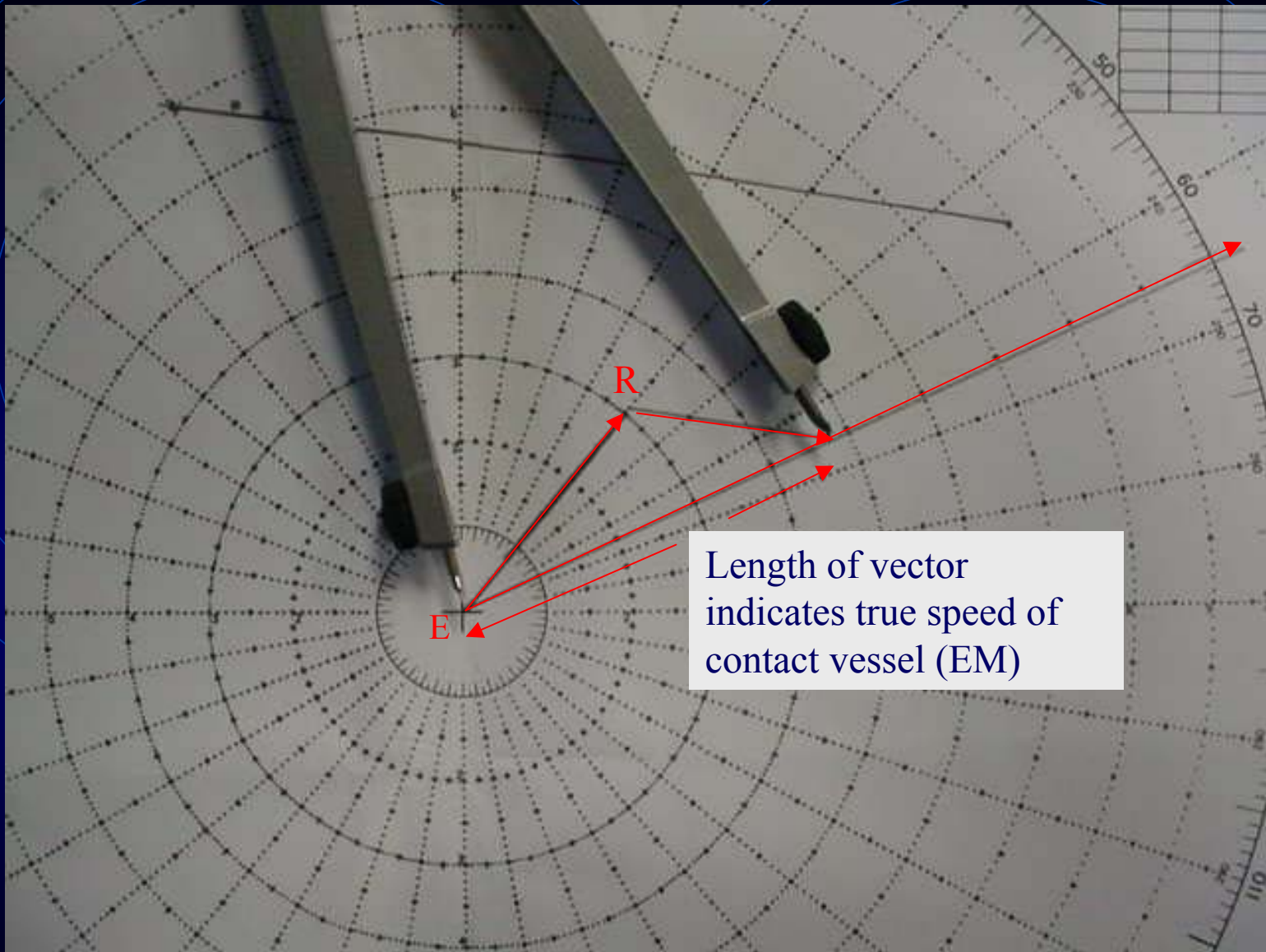




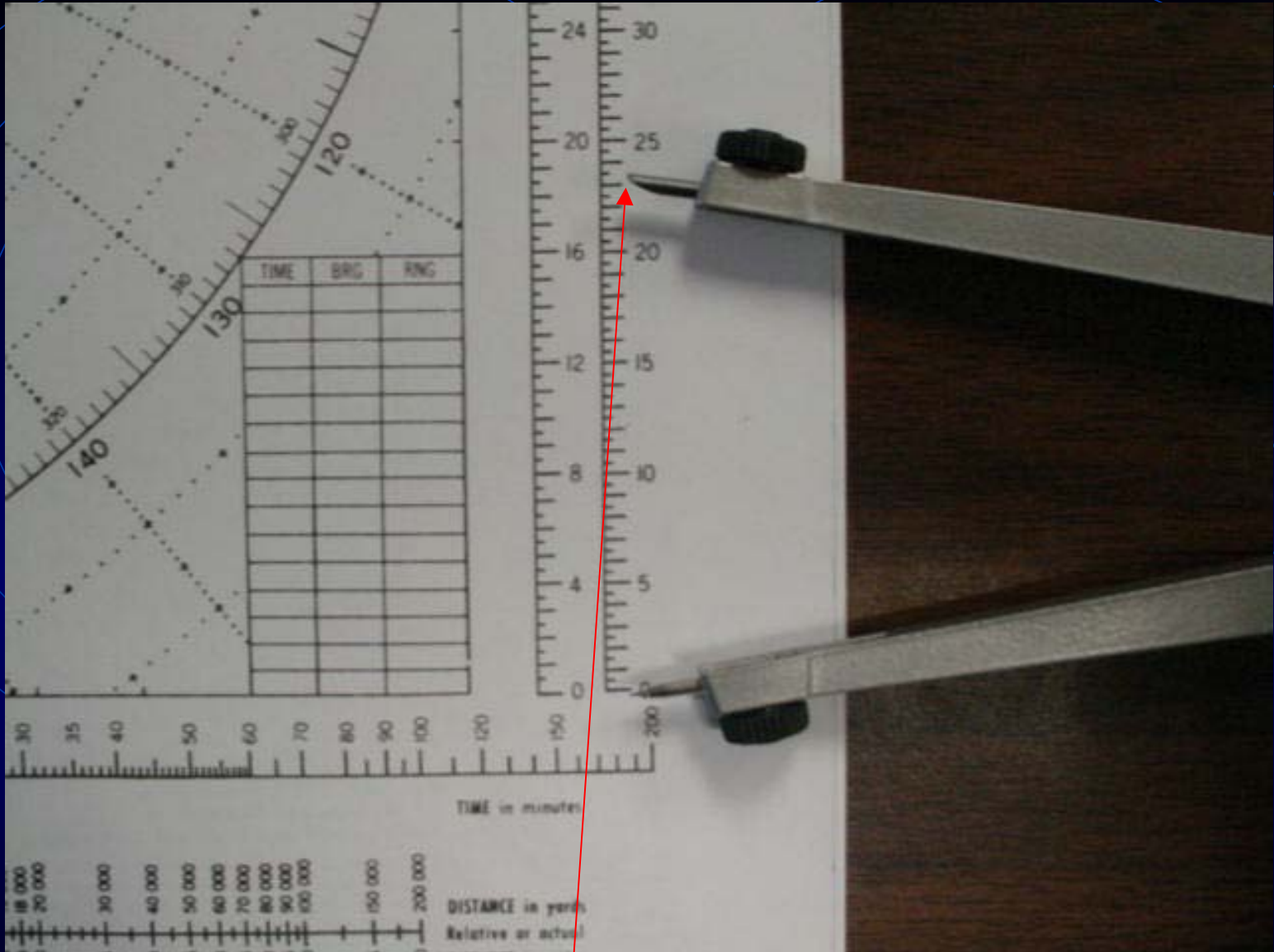
Now, using your parallel plotter, slide your relative motion line down to the tip of E R. Using your SRM, draw a vector – this becomes R M.



Next, connect E to M, this vector becomes the contact vessels true course and speed.



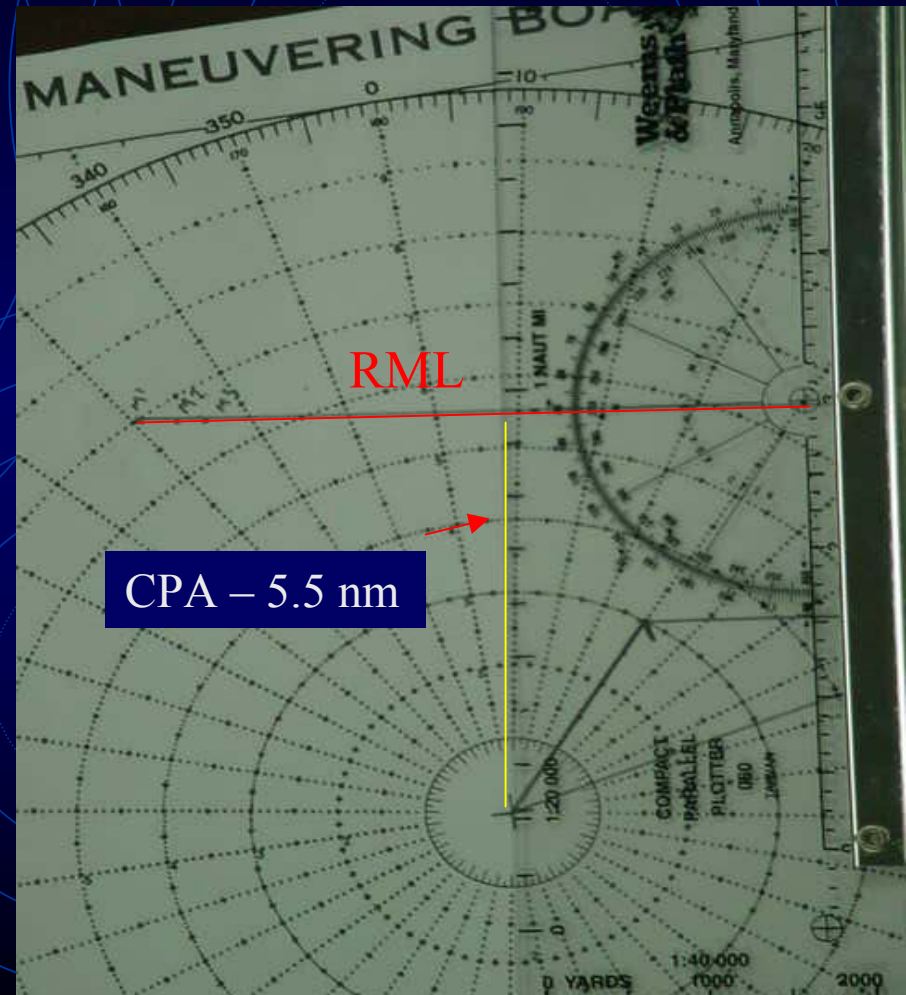
Length of vector
indicates true speed of
contact vessel (EM)

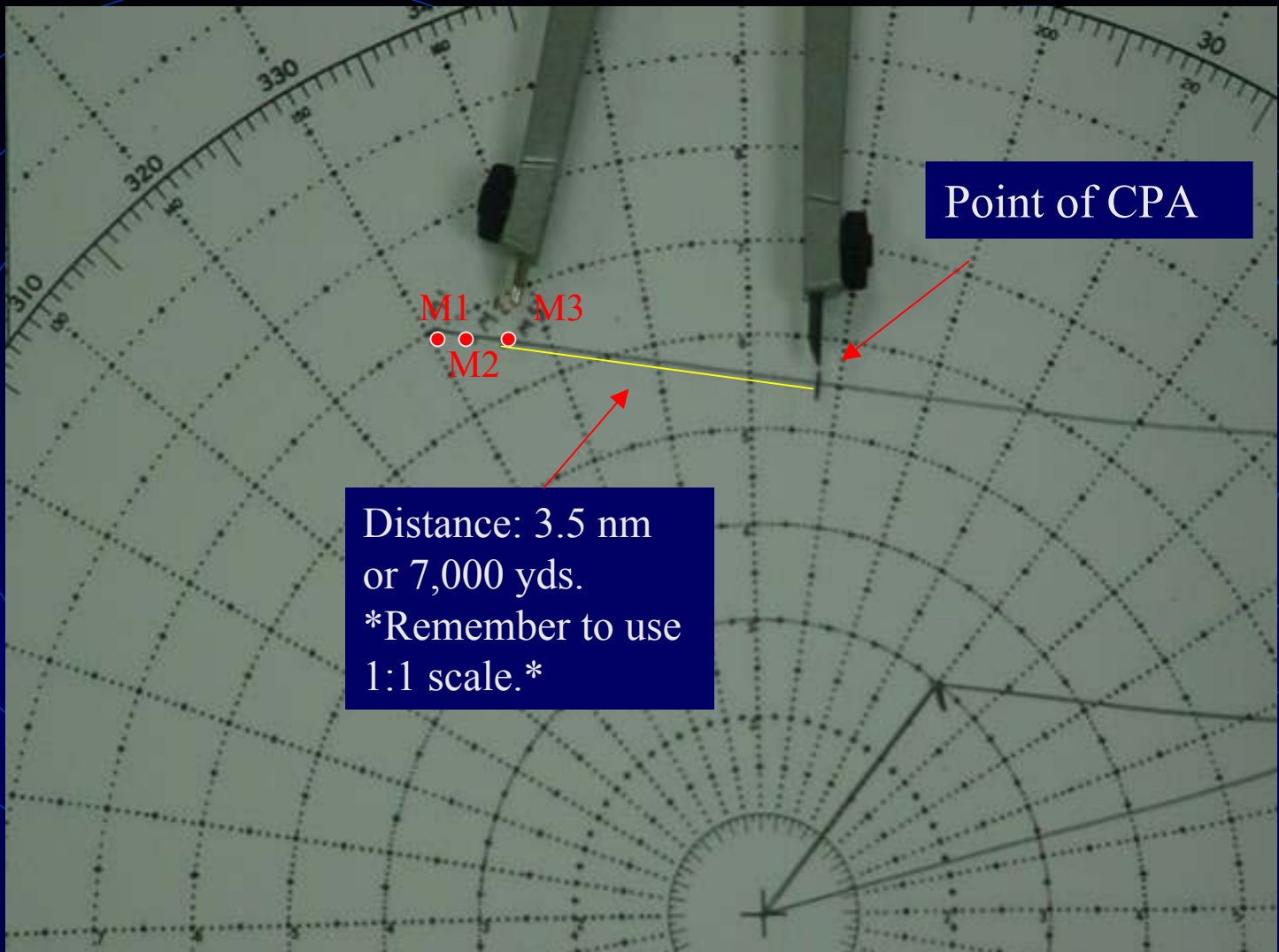


Contacts true speed is 23 knots

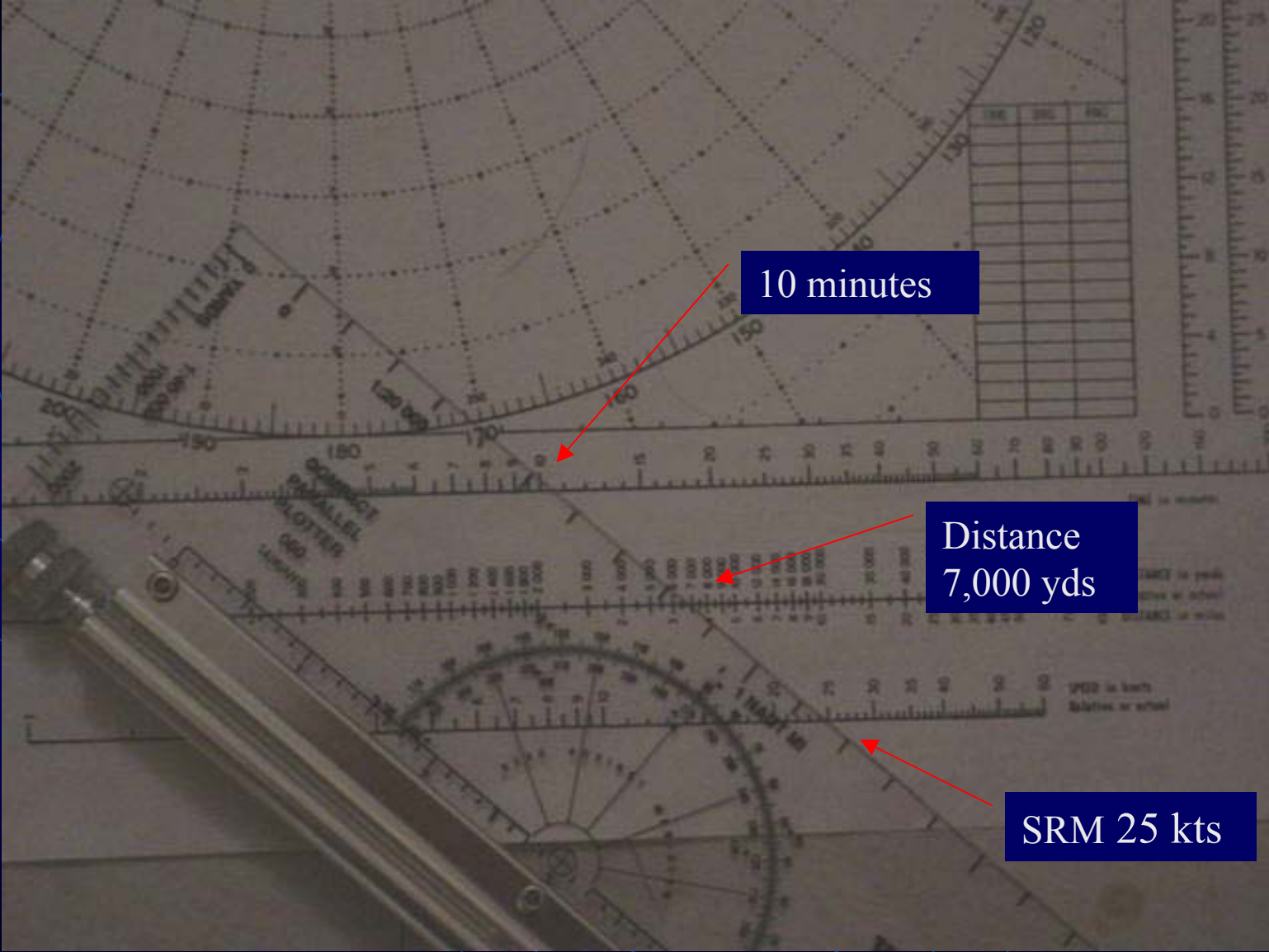
Determining CPA & TCPA

To determine the contact vessels closest point of approach, use the center line of your parallel plotter & align it at a 90° angle to the center of the board. Next, measure the distance, this is the CPA.





To determine the time to CPA, measure the distance from the point of CPA to the last of your 3 plots (M3). After you have the distance, refer back to your SRM (Speed of Relative Motion) which was 12 kts. Now you have distance and speed, go back to the logarithmic scale on the bottom of the board.



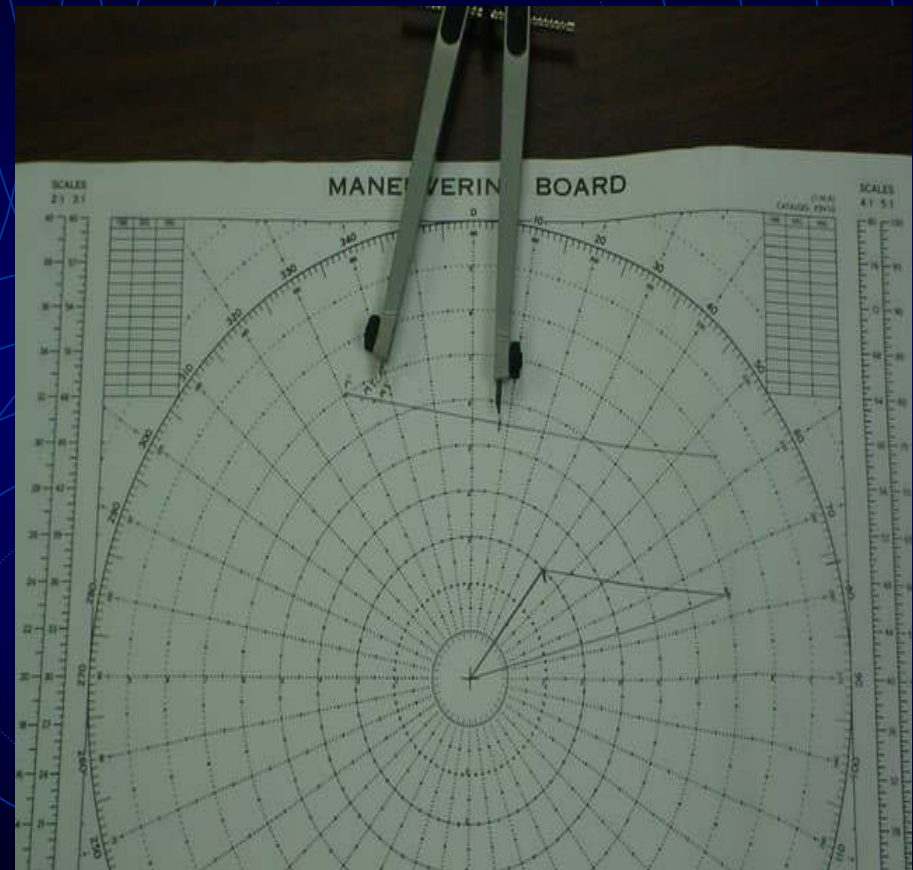
10 minutes

Distance
7,000 yds

SRM 25 kts

Calculating CPA

Now that you've determined that the CPA will be 10 minutes, you must add the 3 plots (M1, M2, M3) 3, 6, and 9 minutes. If your first plot (M1) was taken at 1200, your M3 plot was at 1209, add the 10 min you just calculated making the time of CPA 1219.



Final Results

- Contacts True course: 066'T
- Contacts speed: 23 knots
- TCPA: 1219
- CPA: 11,000 yards or 5.5 nm

Problem #1

OS Course: 230'T Speed: 18 knots

M1: Brng: 110'T Range: 8.2 nm

M2: Brng: 113'T Range: 7.9 nm

M3: Brng: 115'T Range: 7.7 nm

Determine contacts True course, speed, CPA, TCPA

Assume first plot was taken at 1200

Change slide for answers

Answers

- Course: 235'T
- CPA: 6nm

Speed: 29 knots
TCPA: 1235

Note: All answers may vary slightly

Problem # 2

OS Course: 270'T Speed: 16 knots

Contact: M1 Bearing: 250'T Range 4.8nm

M2 Bearing: 252'T Range 4.6nm

M3 Bearing: 255'T Range 4.4nm

Find contact vessels True course, speed, TCPA, CPA

Answers

True Course: 300'T Speed: 15 knots
CPA: 3.6nm TCPA: 1235

Note: All answers may vary slightly