

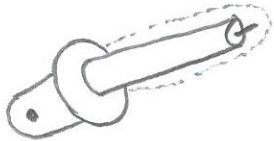
# BASICS OF USING NEAR-FIELD PROBES

W2AEW

## E-FIELD $\hat{z}$ H-FIELD PROBES

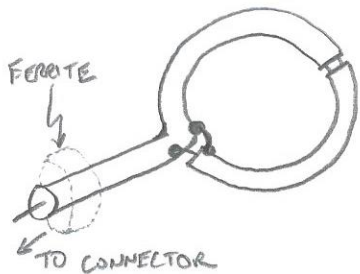
### TWO TYPES OF PROBES

#### E-FIELD PROBES



- RESPOND PRIMARILY TO ELECTRIC FIELDS
- ELECTRIC FIELDS PRODUCED BY VOLTAGE CHANGES
- TYPICALLY LOOK LIKE A "STUB" ANTENNA, OR A "BALL"
- BASICALLY INSENSITIVE TO ORIENTATION

#### H-FIELD PROBES



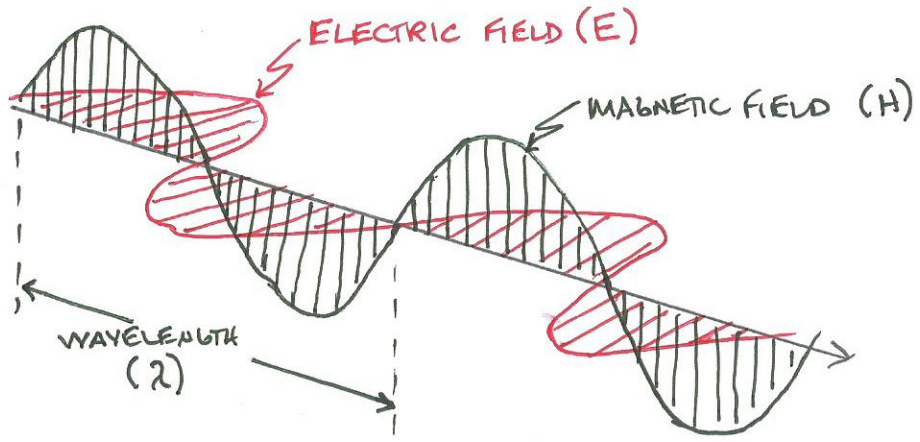
- RESPOND PRIMARILY TO MAGNETIC FIELDS
- MAGNETIC FIELDS PRODUCED BY CURRENT CHANGES
- LOOK LIKE A LOOP, INCLUDE A SHIELD TO MINIMIZE E-FIELD PICKUP
- SENSITIVE TO ORIENTATION - RESPONDS TO CURRENT THAT IS IN THE SAME PLANE AS THE LOOP (PARALLEL TO LOOP)

UNSHIELDED LOOPS RESPOND TO BOTH E  $\hat{z}$  H FIELDS

Q - WHY DO WE CARE ABOUT LOOKING AT BOTH E & H FIELDS?

W2AEW

A - THE STRENGTH OF EACH TYPE IN NEAR FIELD CAN VARY SIGNIFICANTLY FROM THE STRENGTH IN THE FAR FIELD  
 - HELP TO TELL US ABOUT THE SOURCE OF THE RADIATION



WAVE IMPEDANCE  $Z_w = \frac{E}{H}$

IN FAR FIELD, IS 377 Ω

IN NEAR FIELD, DEPENDS ON THE SOURCE OF THE WAVE

- LARGE ΔV, SMALL ΔI  $Z_w > 377$
- LARGE ΔI, SMALL ΔV  $Z_w < 377$

