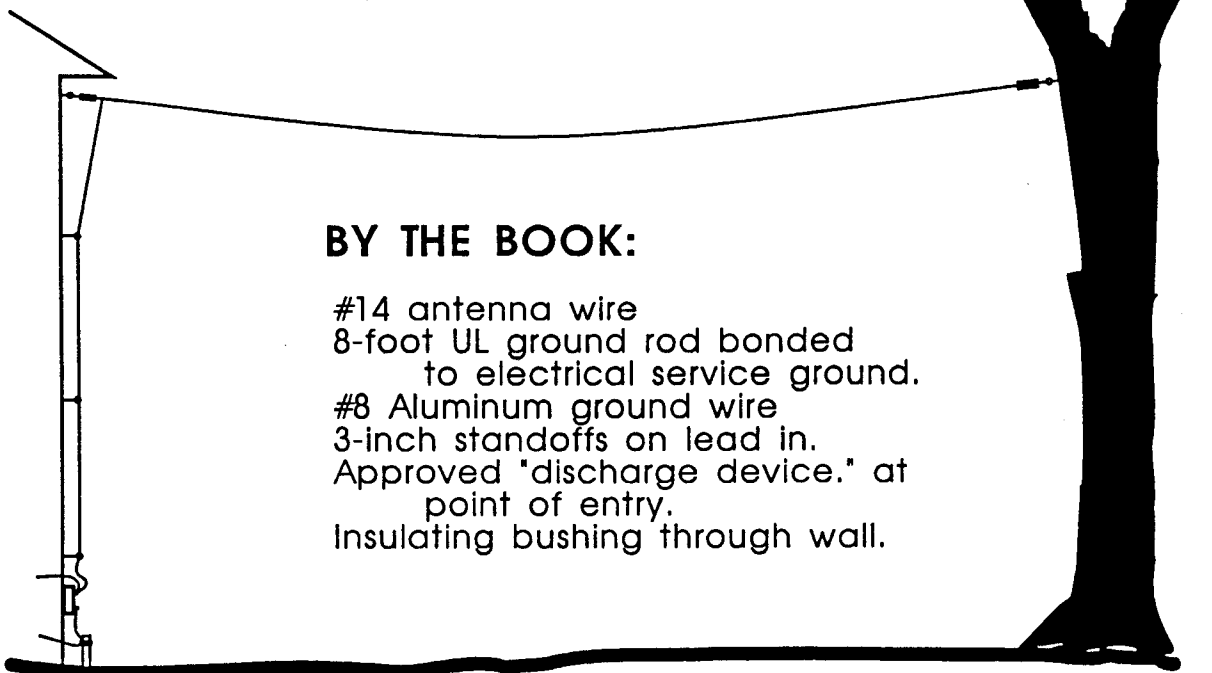

PRACTICAL WIDE-BAND ANTENNA SYSTEMS

FOR MEDIUM AND SHORT-WAVE RECEPTION.

By Al Klase

BASIC INVERTED-L



BY THE BOOK:

#14 antenna wire
8-foot UL ground rod bonded
to electrical service ground.
#8 Aluminum ground wire
3-inch standoffs on lead in.
Approved "discharge device." at
point of entry.
Insulating bushing through wall.

MATERIALS

WIRE

Any wire will work.

#14 stranded, *a la* Radio Shack, is a good bet for permanent installation.

Insulation may help among tree branches.

INSULATORS

Not critical in receiving antennas.

Commercial: glass, plastic, or ceramic.

Homemade: plastic pipe etc.

MATERIALS (continued)

ROPE

Properly colored polyester rope is almost "forever."

3/16 inch is about right for most applications.

Hamfests are best source.

Parachute cord is OK.

White synthetic rope is attacked by sunlight.

ANTENNAS

3

INSTALLATION

TREES ARE YOUR BEST FRIEND

Try a slingshot with 1-2 oz. sinkers and a spinning type fishing rod.

You'll probably need an intermediate size cord to raise the rope halyard.

A rope just pulled over a limb and tied off at the base of the tree works just fine.

Install a pulley and counter weight or screen door spring with trees that sway in the wind. A gallon jug of water make a good weight.

ANTENNAS

4

GROUNDS

Place a ground rod at the entry point to the house to head off lightning. This may not turn out to be a good RF ground.

The cold water pipe may be the best ground you're going to get, and is probably bonded to the electrical system.

Parallel multiple grounds. Listen for change in signal to noise ratio as each is added.

Don't get bogged down in a lot of hypothetical hogwash regarding "ground loops." They are mostly an audio problem.

LIGHTNING ARRESTORS

There ain't no such thing! (any more)

In Newspeak: *Discharge Devices*

Head off lightning at entry point:

Disconnect and ground antenna when not in use. (knife switch)

Commercial devices: TV twin-lead units. Ham radio stuff.

Spark gap or gas tube. e.g. vintage lightning arrestors.

Grounding the shield of coax at entry point.

Prevent buildup of static:

Especially important if connecting to solid state equipment.

Ground the antenna for DC. Balun, RF choke (approx. 2.5 mH)

If nothing else: 100K resistor to ground.

CONNECTING TO THE SET

Insulated wire from entry point to radio

Simple low-cost solution.

Picks up noise.

OK for short runs.

Coaxial Cable

Eliminates noise pickup

Signal loss in long runs if not matched to antenna and set.

Coax with matching transformers

Best solution.

Splitters to feed multiple radios.

Also, allows use of TV cable accessories.

75 OHM COAXIAL CABLE

Readily available

Inexpensive, easy to install connectors

Two basic types: RG-58 and RG-6

Many useful cable TV accessories:

Switches: A-B, A-B-C, etc.

Wall outlets, feedthrus, grounding blocks

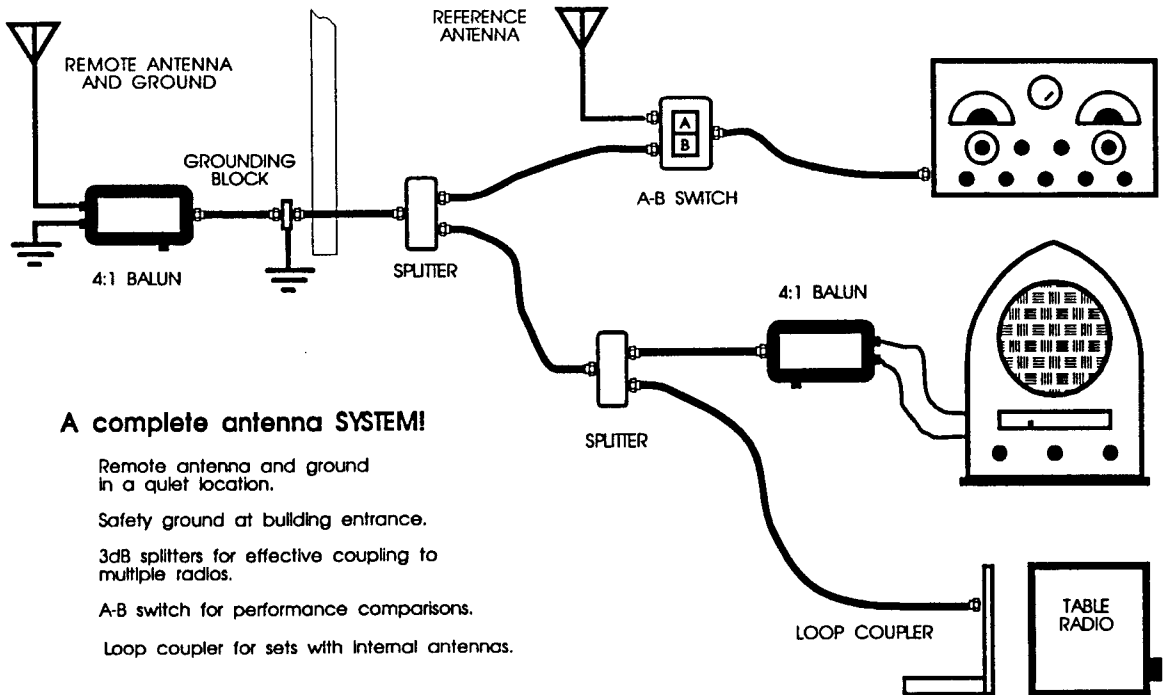
Patch cords, attenuators, adapters

**Frequency sensitive devices that don't work below
10MHz:**

Splitters

Amplifiers

FULL-BLOWN SYSTEM



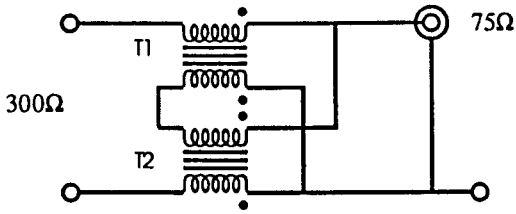
TRANSFORMER CONSTRUCTION



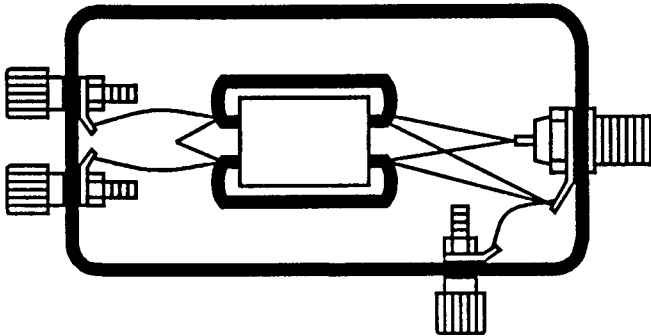
ONE
TRIFILAR
INDUCTOR
(TWO TURNS)

TWO
SEPARATE
BIFILAR
INDUCTORS
(TWO TURNS EACH)

4:1 CHOKE BALUN



- Improves impedance match between antenna and coax.
- Keeps noise on cable shield out of antenna-ground circuit.
- Can be used to couple coax to receivers.
- Covers MF and HF frequency ranges.
- DC path to ground eliminates static build up.

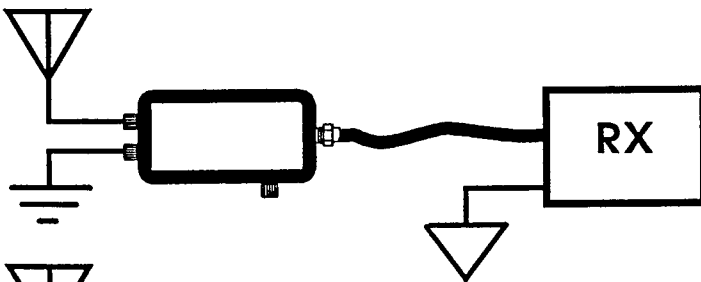


BLN-73-202 FERRITE CORE
FROM AMIDON ASSOCIATES

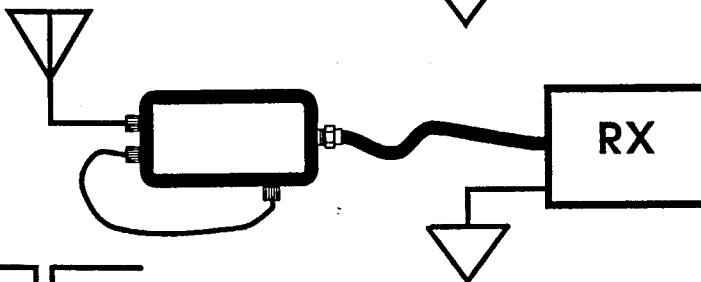
T1 7 BIFLAR TURNS #26

T2 7 BIFLAR TURNS #26

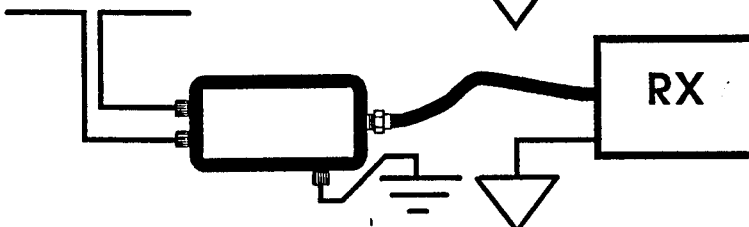
BALUN APPLICATIONS



Antenna operated against earth
cable isolated.

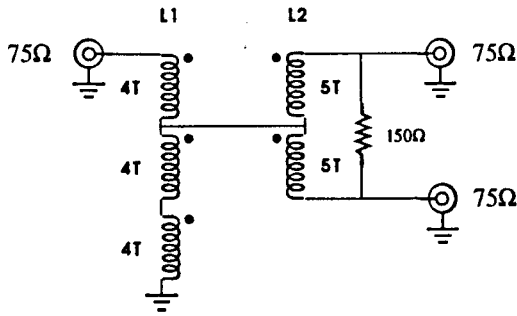


Antenna operated against
cable shield.



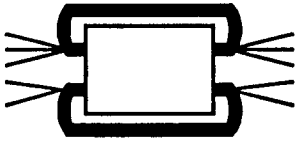
BALANCED (DOUBLET) ANTENNA.

3dB SPLITTER/COMBINER



- Divides input power in half while maintaining 75 ohm impedances.
- Wide bandwidth: <100KHz to >30MHz
- Hybrid design provides >30dB isolation between outputs.
- Can also be used to combine two signals with no loss.

L1 4 TRIFLAR TURNS #26

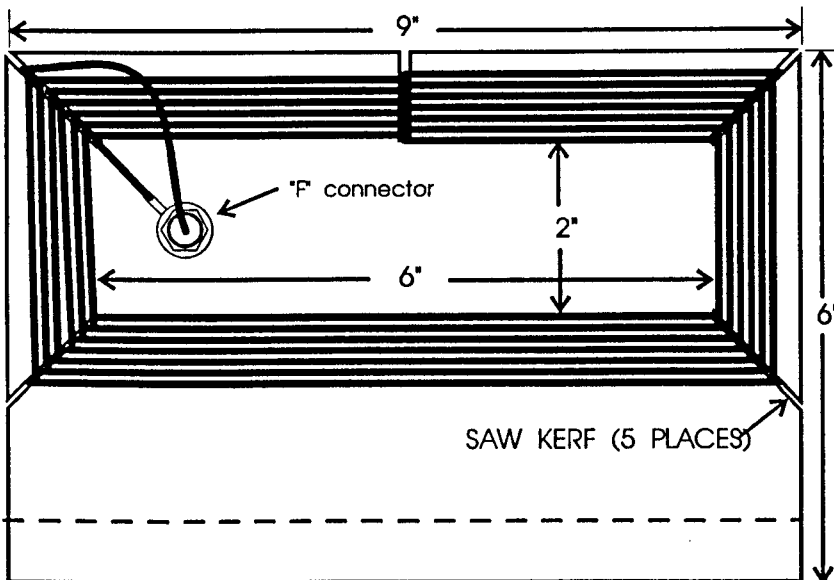


BLN-73-202 FERRITE CORE
FROM AMIDON ASSOCIATES

L2 5 BIFLAR TURNS #26

LOOP ANTENNA COUPLER

Connects 75 ohm coax to receivers with loop antenna



Cut from 1/4 in. plywood.

13 turns number 22 hook-up wire.

3/4 inch wood base (behind).

TESTING

Building a good antenna system is an experimental proposition. Careful testing is essential.

Arrange an A-B switch to compare your new antenna to the old "reference" antenna.

It's usually best to work in daylight when atmospheric noise is lower and ground-wave signals are available. (minimum fading)

Chose a marginal AM station and work for improved reception.

A communications receiver with an S-meter is helpful but not essential.