

## Radio Interference Sources

The following is a partial list of common potential AM radio noise sources. The best strategy to deal with these is to turn-off the source if found to be noisy. When that is not practical, use mode #2 or #3 and an extended cable to place Super Select-A-Tenna as far away from the source as possible, and orient for the least amount of signal pick-up from the noise source. You can also use mode #2 or #3 to test each potential noise source by placing the unit near the source while listening for any increase in noise on your radio.

Television Receivers	CO2 and Smoke Detectors
Computers and Monitors	Digital Thermostats
Calculators and Keyboards	Computer Modems
Other Radios (AM or FM)	Fax Machines
Florescent Lights	Small Gas Engines
Lamp Dimmer Controllers	Theft Deterrent Controllers
Fan Motor Speed Controllers	Pagers and PDA's
Electrostatic Air Cleaners	Digital Cameras
Neon Signs & Power Supplies	Video Cassette Recorders
Computer Printers and Scanners	Space Heater Controllers
Digital and Cordless Telephones	Wire Fence Controllers
High Intensity Discharge Lamps	Digital Clocks
Computer Power Supplies	High Voltage Power Lines
Credit Card Point-of-Sale Terminals	Xenon Flash Lamps
Microwave Ovens	CD and DVD Players
Battery Chargers	Cellular Telephones

### Intensitronics Corporation

P.O. Box 28 Ashland, Wisconsin 54806

Tel: 1-800-382-4155 Fax: 715 685 0474

[www.selectatenna.com](http://www.selectatenna.com)

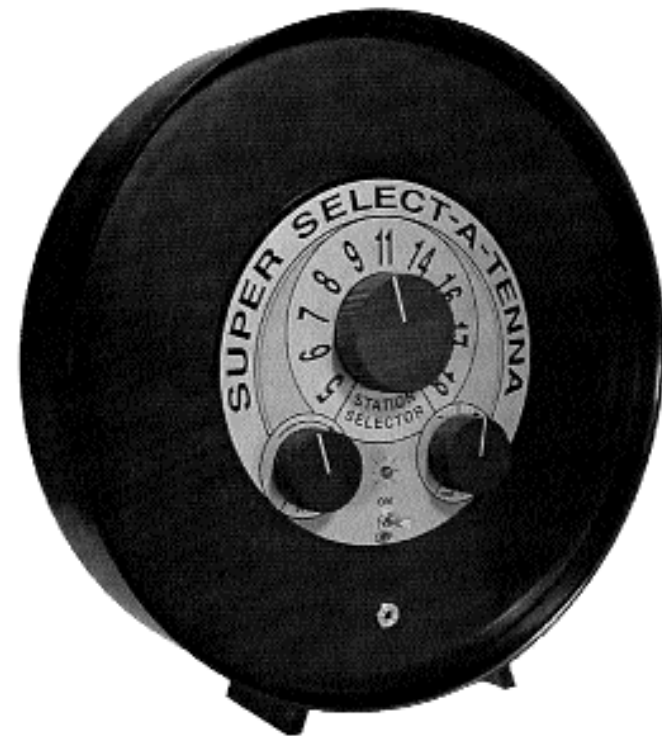
E-Mail [cardinal@acd.net](mailto:cardinal@acd.net)

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# Super Select-A-Tenna

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## User Manual



Intensitronics Corp.

## Introduction

The Super Select-A-Tenna is the next generation of AM antennas that started in 1971 with the original Select-A-Tenna. This new unit has many of the same easy-to-use features of the original plus the following:

- Fine Tuning control in addition to Main Tuning control.
- 40 dB maximum useful gain
- Adjustable gain and bandwidth control
- High-signal/low-impedance drive output jack
- Improved adjacent channel rejection

These features require the following additional content:

- Internal 9 Volt battery
- ON/OFF switch
- Automatic 1/2 hour shut-off timer
- Operation and battery status indicator LED

The Super Select-A-Tenna is an AM radio antenna system that operates with your radio in four different modes that you can select. Each of these modes is similar in performance but unique to best fit your particular radio and listening environment. They are described in detail on the following pages:

- Mode #1. Direct near-proximity..... pg. 9
- Mode #2. Ferrite Probe near-proximity (*Preferred*) pg.11
- Mode #3 Direct hard-wire antenna connection..... pg.14
- Mode #4 External Antenna and Ground..... pg.15

### Warranty Statement

The period of the limited warranty is 1 year from date of purchase, during which, Intensitronics will replace or repair any defects not resulting from modification, misuse or operation outside specifications. (see page 5.)

## Using the System (cont.)

### Mode #4. External Antenna & Ground Operation

An External Antenna and Ground Cable Assembly and Jack are provided to allow the connection of an external long wire antenna and ground to the Super Select-A-Tenna (see the front view for the Jack location, page 3, and the accessory cords and probes view for the Cable Assembly, page 4 ).

Because the Super Select-A-Tenna is, by itself, a superior antenna system, the only operating condition that requires a connection to an external antenna and ground occurs when your radio and the Super Select-A-Tenna are inside a metal building that attenuates the incoming radio signal significantly below that which can be obtained outside the metal structure.

In this mode of operation, plug the External Antenna and Ground Cable assembly into the front jack of the Super Select-A-Tenna. Then connect an extended long wire from outside the metal structure to one of the leads of the Cable Assembly, and connect a good ground (such as a water pipe) to the other lead of the Assembly.

Then use the unit in either modes #1 or #2 as previously described. The external antenna and ground will provide a "conduit" for the radio broadcast signal into the metal structure to the Super Select-A-Tenna and then to the radio.

Since radio signals will penetrate just inside large holes in the surface of metal structures, an alternative to using a wire antenna outside the structure, is to simply place the Super Select-A-Tenna inside near a large outside window, and then use modes #2 or #3 with your radio as previously described. (Make sure that the window is not covered by a metal screen)

### CAUTION

The use of external antennas is a risk in lightning storms. The addition of a good lightning arrestor and ground to the antenna lead before it enters the building structure is strongly recommended.

When routing long wire antennas outside of a building, be careful to route away from any electrical power or telephone cables - contact with either can cause personal injury.

## Using the System (cont.)

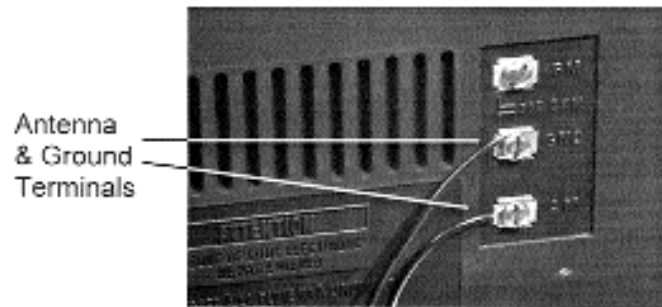
### Mode #3. Direct Hard-wire Connection to a Radio Antenna Input

If your radio has no internal AM antenna and only has antenna terminals, the following procedure may be used. Use the External Antenna and Ground Lead and Plug Assembly (see accessory cords and probes view, page 4). Plug the Assembly into the High Signal Output Jack on the back cover of the Super Select-A-Tenna, and then connect the leads to the antenna and ground terminals on your radio.

The controls on the Super Select-A-Tenna will function the same as when using with the Ferrite Probe.

**TIP:** If your radio has both an internal antenna and external antenna terminals: 1) Experiment between modes #1, #2 and #3 for the best results. 2) Separate your radio's internal antenna and the Super Select-A-Tenna by a minimum of 20 inches when using mode #3 to avoid potential interaction between the two antenna systems.

### Direct connection illustration (typical)



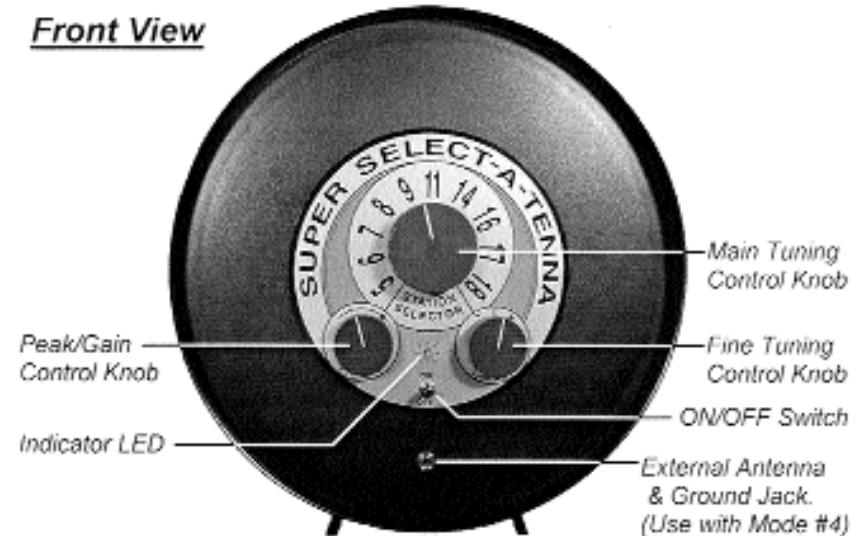
### Caution

Never use any of the provided cables or any other cables, to attach the Super Select-A-Tenna to 110/220 Volt AC Power, or Telephone, or TV-Video Cable systems.

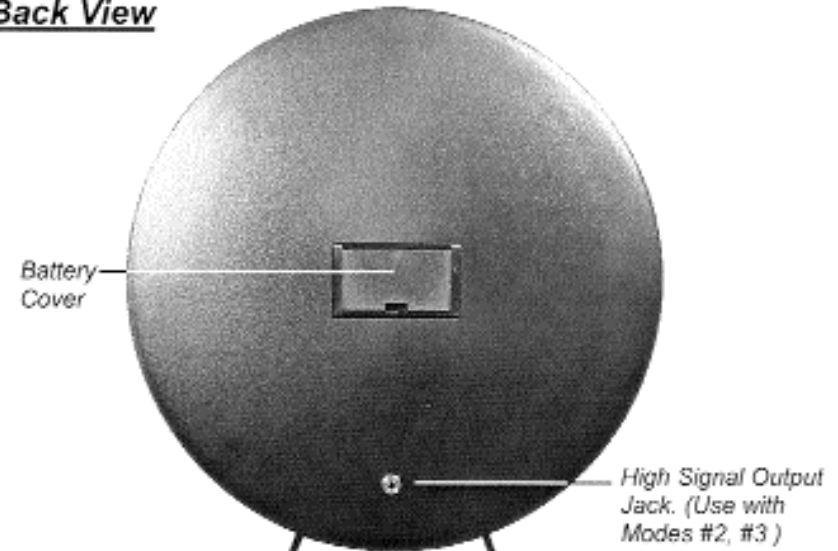
## Checking out the System

Take a quick look at the Super Select-A-Tenna and familiarize yourself with the options available.

### Front View

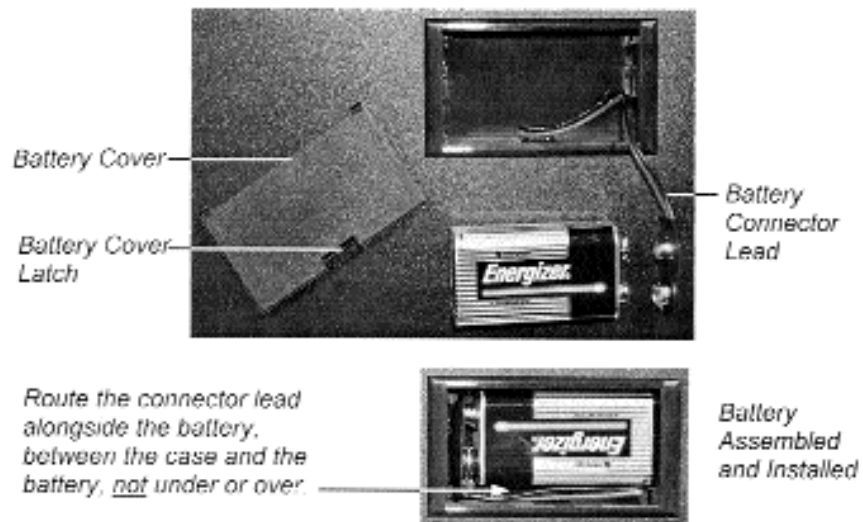


### Back View

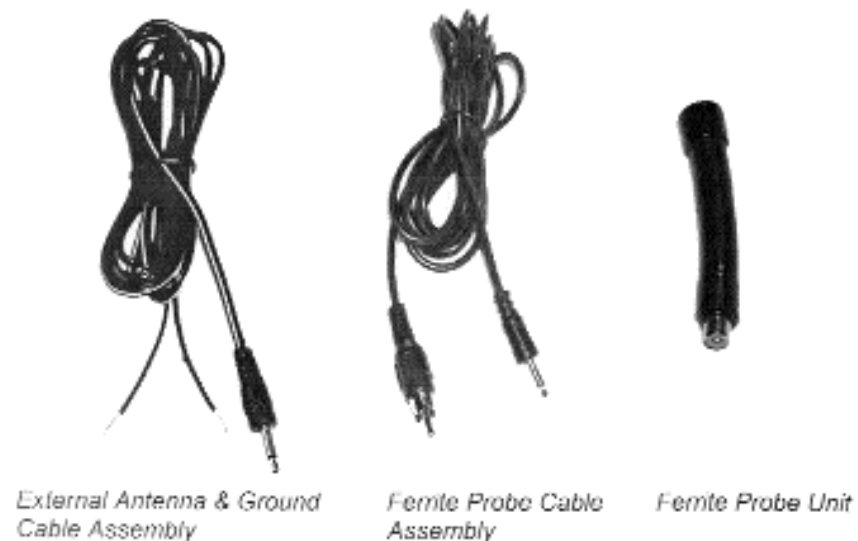


## Checking out the System (cont.)

### Back views with Battery Cover Removed

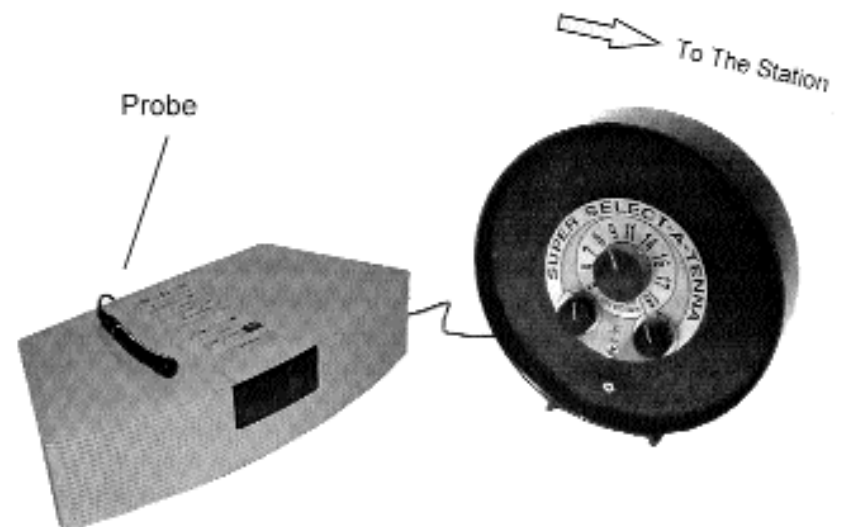
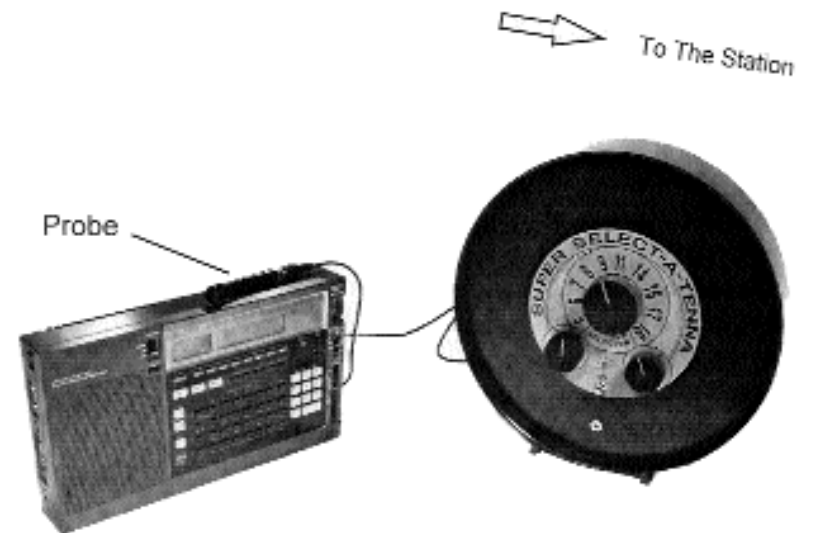


### Accessory Cords and Probe



## Using the System (cont.)

### Ferrite Probe examples



### ***Ferrite Probe Near-Proximity Mode (cont.)***

- Extension cables are available that will extend the length of the provided 6 ft. cable by up to an additional 20 ft. In many situations, this may facilitate access of the Super Select-A-Tenna to a physical location with a stronger and/or a more noise-free signal.

Operation of the system in the Ferrite Probe Mode is very similar to the Direct Near-Proximity Mode #1 previously described. The controls operate the same. As before, the same experimentation is required to find the best orientation of the Probe relative to your radio's internal antenna. Place the Probe on the radio case with the Super Select-A-Tenna ON and the Peak/Gain Control Knob at its lowest setting (full CCW). Adjust the Main Tuning Control Knob to the same weak station as the radio. After the signal increase is peaked by tuning, move the Probe around the radio case, finding the best position and orientation for signal transfer. Once this arrangement is found, reorient the Super Select-A-Tenna relative to the station and retune and then adjust the Peak/Gain Control Knob for best signal and bandwidth.

#### **USEFUL TIPS**

1. When using the system in the Probe Mode of Operation, after finding the best orientation of the Super Select-A-Tenna relative to the radio station, also try an orientation with the Super Select-A-Tenna rotated about 180 degrees around the vertical axis. Most of the time there will be no difference in radio signal strength, but sometimes there will be a significant difference. Use the better orientation.
2. When using the system with a radio that provides synchronous detection, fine tuning the Super Select-A-Tenna slightly away from the peak as previously described, and in the direction of the radio synchronous detector setting, sometimes greatly improves listenability.

## **Getting Started**

### **Battery**

The Super Select-A-Tenna uses the standard 9 Volt battery, which can be purchased almost everywhere. These batteries come in basic carbon-zinc, alkaline, and rechargeable forms. The carbon-zinc and alkaline are non-rechargeable and carry a charge of 9 Volts when new. The rechargeable is available in three varieties (7.2, 8.4, or 9.6 Volts) depending on manufacturer and price. The Super Select-A-Tenna will operate with any of these batteries. We recommend the standard non-rechargeable alkaline which will give a longer life than the carbon-zinc of about 100 hours of use before the low battery indicator LED turns on at 6.5 Volts. The Select-A-Tenna will continue to function down to about 5.5 Volts, providing you significant time to replace the battery after the indicator LED turns red.

#### **RECOMMENDATION**

Replace the depleted battery without delay

If a rechargeable battery of 7.2 or 8.4 Volts is used, the only difference in performance will be the earlier turn-on of the low battery indicator LED during discharge. The turn-on threshold will still be at 6.5 Volts, and these batteries require less voltage change to decay to the same turn-on threshold.

#### **IMPORTANT**

Do not use a power-supply in place of a battery. Anything other than a 9v style battery could damage the Super Select-A-Tenna. Additionally, the power supply may produce radio frequency (RF) noise which will be received by the Super Select-A-Tenna and compromise otherwise good antenna/radio system performance.

#### Environmental Specifications

Temperature: Operating: 40 °F to 110 °F  
Storage: -20 °F to 110 °F  
Humidity: All Temps. 10% to 90% (non-condensing)

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## Getting Started (cont.)

### **Battery Installation** ( see back view picture, page 4 )

Remove the battery cover using your finger nail, a small screwdriver or similar device to depress the cover latch in its groove. Extend the battery connector lead and snap it to the battery as indicated. The battery connector will only attach one way. Place the battery and lead back into the box.

### **IMPORTANT**

Route the lead between the end and side of the battery and the battery box. Do not place the lead directly under or over the battery as that will not provide sufficient clearance for the battery cover and may place excessive outward force on the cover when it is closed. This may make removing the cover difficult. Test the assembly of the cover to the battery box for sufficient clearance before snapping it closed.

### **Indicator LED** ( see front cover picture, page 3 )

The Indicator LED serves two purposes. It indicates when the Select-A-Tenna is turned on, and it changes color from normal green to red when the battery is below 6.5 Volts. The indicator will display red for very low battery voltages, but a completely dead battery will obviously indicate neither color.

### **ON/OFF Switch** ( see front cover picture, page 3 )

The ON/OFF Switch is a three position center-normal switch momentary to either ON or OFF. Switching the unit to ON will cause the unit to function for about one half hour, after which an internal timer will automatically turn the unit OFF. Switching the unit to OFF from the ON condition will turn the Select-A-Tenna OFF immediately. When the unit automatically turns OFF after the time-out period, simply switch back to ON for another half hour time-out period.

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## Using the System (cont.)

### **Mode #2. Ferrite Probe Near-Proximity Mode**

Plug the larger diameter end of the Ferrite Probe Cable Assembly into the Ferrite Probe (see page 4) and the other end into the High Signal Output Jack (see the back view of the unit, page 3). The Select-A-Tenna is now ready for Ferrite Probe operation. In this mode of operation the unit receives the signal from the station and transfers it to the probe. The probe then produces a concentrated high-level field of RF energy. By placing the probe near the internal ferrite rod antenna that is inside your radio, the energy is transferred to your radio by a similar near-proximity magnetic field effect. (See page 13 for examples.)

When using this mode of operation it is recommended that the Super Select-A-Tenna and the Ferrite Probe be physically separated by at least 20 inches. This insures that interaction between the Ferrite Probe and the Super Select-A-Tenna will not occur. Since the Super Select-A-Tenna is electrically driving the Probe, any magnetically coupled feedback from the Probe to the Super Select-A-Tenna may be regenerative or degenerative depending on their mutual orientation if they are physically located close together.

This mode #2 is probably the best operational usage of Super Select-A-Tenna for the following reasons:

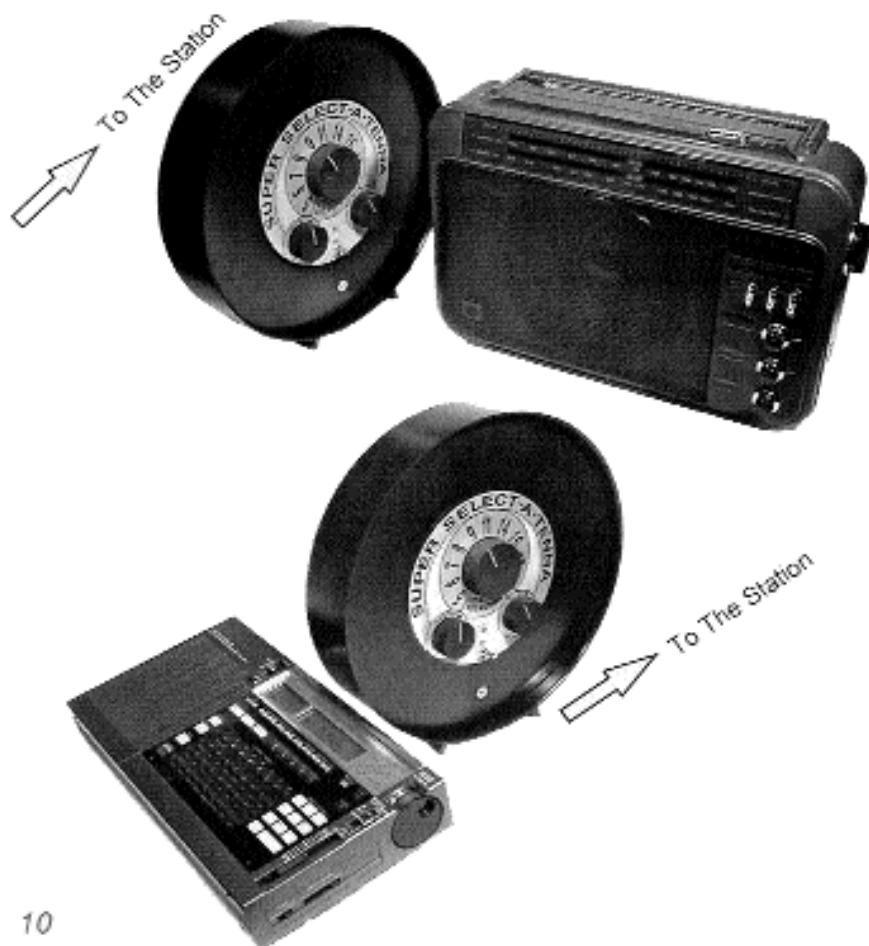
- Gain and bandwidth performance is the same
- The probe is smaller and more concentrated and can be physically located closer to the radio antenna on radios with larger cases
- Your radio's orientation relative to the station is not important; only the orientation of the Super Select-A-Tenna. This allows placement of your radio as you see fit.
- The Super Select-A-Tenna may be physically located at a distance from the radio where it is more convenient and where it may be removed from interfering radio noise sources while still allowing the radio to remain located where it is most convenient.



### ***Near Proximity and Gain Interaction (cont.)***

Increasing the Peak/Gain setting slightly will compensate for the interaction reduction effect. Moving the unit away from your radio will also compensate for the effect. By experimentally adjusting the Peak/Gain Control Knob and moving the Super Select-A-Tenna slightly toward or away from your radio, you will produce the optimum listenability results. The interaction effect is most noticeable at the highest Peak/Gain settings.

### **Direct near-proximity orientation examples**



## **Common Features Explained**

### ***Main Tuning Control Knob***

*( see front cover picture, page 3 )*

The Main Tuning Control Knob tunes the Super Select-A-Tenna across the entire AM broadcast band from 535 kHz to 1710 kHz with almost linear response over 300 degrees of rotation. This is the control knob used when first tuning to a new station.

### ***Fine Tuning Control Knob***

*( see front cover picture, page 3 )*

The Fine Tuning Control Knob also tunes the Super Select-A-Tenna, but only over +/- 12 kHz in the same 300 degrees of rotation. This allows very fine tuning, especially at the high peaking that is obtainable with the unit. The span is sufficient to easily capture the exact tuning required when the main tuning control knob is only set approximately to the desired station. If possible, always fine re-tune your radio after fine tuning of Super Select-A-Tenna.

### ***Peak/Gain Control Knob***

*( see front cover picture, page 3 )*

The Peak/Gain Control Knob changes the gain and the bandwidth of the Super Select-A-Tenna. Full counterclockwise (CCW) rotation produces the lowest gain and the widest bandwidth.

The gain and bandwidth in the full CCW position is equal to the regular Select-A-Tenna, which is about 30 dB. Advancing the control knob clockwise (CW) from this position increases the gain by as much as an additional 16 dB and also decreases the bandwidth. Advancing beyond this point is possible but not practical because the bandwidth beyond this point is so narrow as to attenuate the audio information sidebands into non-listenability. The bandwidth reduction eliminates the high frequency information in the same way as does turning down the treble response in an audio system.

*(continued on next page)*

### **Peak/Gain Control Knob (cont.)**

It is between the lower (CCW) stop and the upper (CW) non-listenability that the control knob has the useful effect. The amount of CW control knob rotation required to produce the full 16 dB gain is almost the full 300 degrees to the CW stop at 510 kHz, and about only 90 degrees at 1710 kHz. A practical and listenable gain increase, due to the compromise of bandwidth loss, is about 10 dB. This is added to the initial 30 dB giving a total of 40 dB. At these levels you will be able to adjust for best signal strength and high frequency noise control to suit your own taste.

### **Peak/Gain and Fine Tuning Interaction**

When increasing the Peak/Gain Control Knob (CW) it may be required to make a small change in the Fine Tuning Control Knob, especially at the higher levels, in order to maintain exactly centered tuning. This is because at the lower level of Peak/Gain, exact tuning is not as critical, but at the higher levels, exact tuning greatly affects listenability.

Exactly centered tuning will be recognized, especially at the higher level of Peak/Gain, when the high frequency noise goes to its lowest level and rotation of the Fine Tuning Control Knob in either direction (CW or CCW) increases the high frequency noise.

### **False Peaking**

Sometimes when using your Super Select-A-Tenna to tune in a weak station, you may think that the unit has peaked on the desired station, when in fact, it has peaked on another, stronger local station to which your radio is not tuned. The best way to find the real peak is to start with the Peak/Gain Control Knob in its lowest gain setting (full CCW), then find the correct station with the Main Tuning Control Knob and check for the numerical dial correspondence. If the Main Tuning Control Knob setting is about 900 kHz greater than your radio dial setting or digital readout, the selection is the image frequency. Tune about 900 kHz lower on the Super Select-A-Tenna Dial. The correct weak station is always identified by some noise or hiss, while a false peak on a strong local stations is not.

## **Using the System**

### **Mode #1. Direct Near-Proximity Mode .**

This mode uses the Super Select-A-Tenna alone, without any of the Accessory Cables or the Ferrite Probe. You simply place the unit near your radio for a mutual magnetic coupling of the two devices. (See page 10 for examples.)

The Super Select-A-Tenna produces a concentrated high-level field of RF energy. Placing your radio in this field increases the broadcast signal level in the same high proportion. The high concentration field extends from the case, up to about 10 inches away from the flat front and back faces, and about 5 inches away from the curved sides. You must place your radio with its internal ferrite rod antenna within this field and orient it properly relative to the Super Select-A-Tenna in order to couple between the two devices. Experiment by placing the Super Select-A-Tenna in different position around your radio while changing the orientation of the Super Select-A-Tenna relative to the radio in each of the positions. This experiment should be conducted with the Peak/Gain Control Knob in full CCW rotation and the unit turned on and tuned to the same station as the radio. Always use a relatively weak station because strong local stations do not demonstrate the added signal strength of the Super Select-A-Tenna.

It will become quickly apparent which side of the radio and which orientation work best. After this, simply retain this arrangement between the devices, and then rotate both relative to the station direction for best signal strength.

### **Near Proximity and Gain Interaction Effect**

Placing your radio in the field of the Super Select-A-Tenna transfers energy from the unit to the radio and, in the process, slightly reduces the gain and increases the bandwidth.

(continued on next page)