

## ITS6000™

### Highway Advisory Radio for 21<sup>st</sup> Century ITS Applications



*ITS6000 Highway Advisory Radio Stations from Information Station Specialists provide new and efficient ways to integrate real-time radio into an ITS project. Radio is as relevant as its content is current. ITS6000 HAR Stations are designed to make broadcast content match current conditions to maximize utility to motorists.*

Conventional Highway Advisory Radio design, kicked up a notch, ITS6000 offers operators the ability to record 3 hours of recordings, 1,000 high quality messages in 50 playlists and, if desired, automatic 'All Hazard' alerts from the National Weather Service, targeted to the area served (e.g., hurricane and AMBER alerts). Two-way redundant control, standard with each station, uses push-to-talk style transceivers (transceivers not included) and the same, familiar broadcasting protocols and voice prompts as regular phones. Computer audio control is available.



## Standard Features

- Non-volatile dynamic message storage.
- Remote control.
- Independent recording, monitoring and erasing of recordings.
- Four-day battery backup operation if AC power is lost.
- Three hours of recordings, 1,000 high quality messages in 50 playlists and 'All Hazard' alerts from the National Weather Service, targeted to the counties services through Specific Area Message Encoding technology.
- Rack-style signal cabinet for high security and multiple option flexibility.

## Options

- **IP76 Digital Message Player** for updating the broadcast program via a standard Ethernet network or via its USB port as a backup. This option affords the highest quality audio programming and the flexibility of keeping the library of messages on your computer. An optional software suite is available for creation (including text-to-speech), editing, processing, playlist generation and archival of broadcast messages in standard MP3 file format.
- **Vertical Profile Antenna System** requiring no buried groundplanes or groundrods. Only one square foot of earth is needed for installation. The system comes with an aluminum antenna support pole that has internal wiring to discourage vandalism.
- **2x Signal Booster**, which doubles efficiency/range of the station's antenna, allowing the transmitter to run at less wattage or allowing the signal to have twice the intensity at a given distance. Functions with upper-band (typically 1610-1700) antennas only. Recommended for federal government agencies that do not have a signal intensity limitation; for any operator in a challenging environment that requires maximum signal intensity to cut through woods, buildings and obstructions. Note: local government licensees must seek a waiver of FCC rules to allow a signal intensity above the standard 2.0 mV/m limitation.

# TR6000™ Transmitter System Specifications

## Standard

Housed in a handsome, pad-mounted aluminum cabinet, the ITS6000 Transmitter System is packaged complete with a transmitter, digital message player, power management and environmental control. The system is protected by high capacity power and telephone surge arrestors. With loss of 120-VAC primary power, the ITS6000 Transmitter System continues full broadcast operation for more than four days on rechargeable batteries with automatic system reset when power is restored. Remote transmitter power and broadcast-monitoring control are included with the system.

### Transmitter

- Remote broadcast monitoring control.
- Synthesized frequency selection, compander-style audio processing.
- Defeat-able LED operation to save power.
- Internal monitor speaker with volume control driven by detector circuit to provide positive modulation indication.
- 24V DC, fully regulated power supply.
- Frequency range: 530 to 1710 kHz AM.
- Frequency stability +/-20 Hz.
- Tunable to European 9 kHz and other channel spacing formats.
- Continuously adjustable power and audio modulation controls, externally accessible on front panel.
- Tunable series filter on RF output.
- Audio distortion: less than 1.2%, 100 Hz to 3 kHz.
- Audio frequency response: +/- 3 dB 50 Hz-12,000 Hz; +/- 3 dB 50 Hz - 3000 Hz with TIS filter.
- Noise level: 70 dB below 95% modulation level, 100 Hz to 3 kHz.
- Modulation: 99%, -40 dB to #20 dB.
- Temperature: -40 to +85 degrees Celsius.
- Humidity: 95% (non-condensing).
- External audio, power and synchronization inputs.
- External PL-259 UHF style RF output.
- Spurious Emissions:
  - - 10.2-20 KHz – greater than 25 dB below unmodulated carrier.
  - - 20-30 KHz – greater than 35 dB below unmodulated carrier.
  - - 30-60 KHz – greater than [5+1 dB/kHz] below unmodulated carrier.
  - - 60 KHz + – greater than 65 dB below unmodulated carrier.
- 1 rack unit.
- Slim-line design (1.75" height, 17" width, 9" depth) and 4 pounds.
- Mean time between failure - in excess of 60 years.
- Estimated product life = in excess of 30 years.
- Speaker with volume control.

## Transmitter System Specifications *(continued)*

### Security Enclosure

- NEMA3R grade, gasketed, with dual doors, aluminum frame and sheeting. Removable rack cage.
- Cabinet footprint: 66.75 inches high by 24.25 inches wide by 32.75 inches deep; 23-inch doors open 90 degrees, front and back.
- 332/334 signal cabinet style. Dual internal locks and locking handles.
- Fan/vent/filter, thermostatically controlled.
- AC power service panel and ground bus.
- Cabinet lights activate/deactivate with door opening/closure.
- Gasketed base, ready for pad mounting. All shelves, brackets and hardware for rack mounting, bolts for cabinet installation.

### Surge Arrestors

- Power surge arrestor: 48 KAmps max – less than 1 nS.
- Telephone line arrestor: 10 KAmps max – fewer than 2.5 nS.

### Power

- 115VAC/220VAC.

### Utilities Required

- 110VAC, phase/50/60 Hz, less than 1 amp AC operating current, 4 amp maximum AC charging current (20A breaker, non-GFI circuit). Standard business telephone line (“central office” type, shielded).

### Four-Day Battery Backup

- 22A/24V DC regulated power supply/battery charger.
  - - LED charge indicators.
  - Digital voltmeter/ammeter.
  - Operational status indicators.
  - Breakers for AC input, battery output.
  - Automatic low-voltage battery and load disconnect, thermal shutdown and recovery, current limiting and over-voltage protection.
  - 110 or 220 volts AC.
  - Accommodates redundant parallel module for auto switchover if main unit fails.
  - Chassis size: rack mount, 2 rack units height.
- 4 sealed AGM batteries, 158 AH @ 24VDC, yielding 4 days of operating time.

## **Transmitter System Specifications** *(continued)*

### **Test Equipment**

- SX200 Wattmeter/SWR Meter with forward, reflected and SWR settings, 200-watt power capacity, lighted dial, UHF connectors.
- Operates in-line.
- Functions to allow precision tuning of antenna on setup, and troubleshooting once station is operational.
- Size and weight: 6 inches by 4.6 inches by 2.5 inches; 1.2 pounds.

### **Instructions**

- Installation, operation, maintenance manual with illustrated instructions.

# NX8R™ Digital Message Player Specifications

## Standard

Designed for our fixed and portable Information Radio Systems, the NX8R Digital Message Player allows operators to record up to 1,000 broadcast messages and store 3 hours of recordings in nonvolatile flash memory. This means, no message (battery) backup is required. Additionally, NX8R provides 8 external contacts to initiate various message playlists, live audio segments and event sequences.

NX8R is a direct upgrade to earlier RAM-based ISS digital message players (AP55 and IP8) with similar protocols and command sets, so relearning protocols is kept to a minimum for existing operators.

### Features listed in red below are exclusive to the NX8R Digital Message Player:

- Voicemail-style natural voice operation with 800-word/phrase capability; voice prompts and status report on available recording time, sequences, security codes, programming parameters and complete status of current audio program, relay states, power.
- Identical remote and local control codes.
- High quality (16-bit sampling rate) recording process, yielding 5500-Hz dynamic range.
- One thousand independent broadcast messages that may be of any length. Each message may be independently monitored and later erased, as desired.
- Automatic message scheduling by time, day, date. Internal time clock never requires setting, keeping time even with total loss of power.
- Fifty message playlists that may contain hundreds of broadcast messages, up to three live sources (each with independent timing control), command for up to four external relays, other (nested) playlists and differing output levels for each audio output. Playlists may be created, recreated or appended locally or remotely.
- Selection of active playlist locally or remotely.
- Eighty minutes of recordable time in dynamic flash memory.
- Three audio inputs for separate and independent live program feeds, each with independent audio level controls.
- Three audio outputs with audio levels settable locally, remotely or programmed to change automatically.
- One- to nine-digit security access code, defeat-able phone prompting, programmable locally or remotely. User-settable number of retries and timeout period for maximum security.
- Five-second and full-message survey monitoring of all stored messages and playlists.
- Eight prioritized control closures to trigger message sequences remotely.
- Control closure prioritization allows automatic interrupts for emergency messages and automatic National Weather Service all-hazard radio notifications (weather and EAS).
- Includes prerecorded messages by professional announcer for advisory radio application -- ready for broadcast immediately.
- Station identification message broadcasts every half-hour.
- Rack mountable, slim design, 1 RU in height.
- Two-way redundant control, which allows full control of the NX8R Digital Message Player via push-to-talk style transceivers (not included) in parallel with and having priority over telephone control. The two-way, redundant control option uses the same commands and protocols as telephone control, including the same voice prompts and control options.

# IP76™ Digital Message Player Specifications

## Optional

Request the iP76 Digital Message Player for updating broadcast programs via a standard Ethernet network or via its USB port as a backup. This option affords the highest quality audio programming and the flexibility of keeping the library of messages on your computer. An optional Software Suite is available for creation (including text to speech), editing, processing, playlist generation and archival of broadcast messages in standard MP3 file format.

### Features:

- Approved for use on Department of Homeland Security networks.
- Memory format: "Flash" – no battery backup required.
- Audio outputs: 8 or 600 ohms.
- File format: MP3. (64-128 kbps recommended).
- Auto reboot on power outage.
- Power: 12VDC/800 ma.
- Local operation via USB:
  - Memory storage: external – limited by flash drive capacity.
  - Message loading: removable USB flash drives; 6 provided; drag-and-drop MP3 messages from PC USB port.
  - Up to 1,023 messages, auto rotation.
  - Message sizes: variable.
  - Message order: continuous sequential message play based on file loading order.
- Remote operation via a network:
  - Ethernet (RJ-45 Port).
  - Audio upload via LAN/WAN.
  - Memory storage: internal – single 20MB (21 minute) message.
  - Built-in GUI allows audio file upload, assignment of static IP settings.
- Optional Software Suite for creation, editing, processing, playlist generation and archival of broadcast messages in standard MP3 file format. System requirements for customer provided PC:
  - Intel Pentium 4 (1.4 GHz for DV, 3.4 GHz for HDV); Intel Centrino; Intel Xeon (dual Xeon 2.8 GHz processors for HD); or Intel Core Duo or compatible processor (SSE2-enabled processor required for AMD systems).
  - Microsoft Windows XP Pro or Home Edition with Service Pack 2 or Windows Vista Home Premium, Business, Ultimate, or Enterprise (certified support for 32-bit editions only).
  - 512 MB of RAM (1 GB for DV playback, 2 GB for HDV and HD playback).
  - 10 GB of available hard-disk space (when used with Loopology DVD).
  - DVD drive.
  - 1280 by 900 monitor resolution with 32-bit video card and 16 MB of VRAM.
  - Microsoft DirectX or ASIO compatible sound card.

# 'All Hazard' Warning System Specifications

## Standard

The Federal Communications Commission (FCC) designed the Emergency Alert System (EAS) so officials could quickly send important emergency notifications to affected counties across the country. This FCC EAS is digital-based and automated, using coding protocols similar to National Oceanic and Atmospheric Administration (NOAA) weather radio Specific-Area Message Encoding (SAME) technology. Under national EAS guidelines, each state and localities within have formed Emergency Communications Committees to serve as liaisons to the FCC, ensuring continuous improvement in the system and ensuring national implementation of the system, so it's useful.

The Automatic All-Hazards Warning System, which comes standard with every ITS6000 System, automatically rebroadcasts FCC EAS/weather targeted national alerts. It includes an FCC-approved EAS/weather radio receiver with antenna, mount and SAME programming. Within the ITS6000 Automatic All-Hazards Warning System, targeted national alerts automatically interrupt regular programming.

## Specifications

- Specific-Area Message Encoder for customer-selected counties, 2,000-county capability.
- Receives all 7-channel, VHF, NOAA weather frequencies and all EAS codes.
- Field programmable and upgradeable.
- Front-panel diagnostics and audio test port that accepts recorded .wav files.
- Detects up to 16 programmed SAME county codes; user-adjustable; triggers program changes based on NOAA EAS/weather-encoded messages.
- Stores most recent alert for local speaker replay.
- 600-ohm continuous output, manual and autotune tuning; integral speaker/volume control.
- Steel chassis; rack mountable.
- External antenna, cut for the EAS/weather radio frequencies and mount with threaded UHF connector, balun and weatherproof gasket.

## GPS Frequency Stabilization System Specifications

### Optional

This option may be added to any ITS6000 Transmitter System to minimize interference among satellite HAR stations. Oscillation phase-lock (PLL) to a common reference carrier allows all radio stations in the system to operate with minimal heterodyne. No external wirelines are required to achieve stability.

- GPS receiver: 8-channel.
- 1 PPS outputs: DB-9 connector, TTL outputs, positive edge true:
  - #1 - 20% duty output <500mS accuracy, directly from receiver.
  - #2 - 50% duty output <1mS accuracy, regenerated.
- Accuracy: 10 MHz @ 10 nS.
- Power: 117 VAC, 50/60 Hz or 24 VDC.
- Mechanical: 19" rack mount 1.6"H x 16.8"W x 9.4"D.



## Power Loss Notification Module™ Specifications

### Optional

#### Features:

- Five programmable notification delay periods.
- Instantaneous to 24 hours.
- Internal battery backup.
- Automatically dials up to 4 telephone numbers.

# Antenna System Specifications

## Standard

The ITS6000 Highway Advisory Radio Antenna System features the standard antenna, which produces a signal intensity of 2.0 mV/m at 1.5 km, the FCC maximum field level. The signal is typically signable at 3 to 5 miles. The antenna may be mounted atop a square or round pole of wood, metal or fiberglass. This HAR antenna system is packaged with a factory-wired groundplane, pole mounts and insulators, a cabinet-protected lightning arrestor system and ground bus for lightning dissipation and groundplane connection. Components include . . .

### Antenna Mount and Insulators

A galvanized-steel mount allows the antenna to be attached to any type of pole, minimum 6" diameter or 6" square. Includes split-plastic insulator mounts and stainless-steel hardware.

### Lightning Arrestor, Enclosure and Ground Bus

Provided in a NEMA-4 cabinet, the lightning arrestor is bonded to an aluminum panel, which serves as support for lightning grounding and groundplane connection clamps.

### Groundplane

A groundplane is the copper wire part of the antenna system buried beneath the antenna support. Our preassembled PowerPlane™ Groundplane is placed in a 6"-to-12" excavation that extends outward 10 to 20 feet (depending on frequency) in all directions from the pad or pole base; it is covered with backfill. The groundplane consists of a central ring of #4 bare copper stranded wire with 62 radials that extend outward in a circular pattern.

### Antenna

- Type: whip (vertically polarized, center loaded, base fed).
- Power rating: 25 watts.
- Length: 15 to 25 feet (specifications vary with frequency of antenna).
- Weight: 8 to 12 pounds (specifications vary with frequency of antenna).
- Wind rating: antennas 1230 kHz and above 100 mph, 80 miles per hour with ¼ radial ice; antennas 1220 kHz and below 80 miles per hour, 50 miles per hour with ¼ radial ice.
- Assembly: 4 sections - base, coil, midtip and tip.
- Position of loading coil: center section.
- Joints: sleeves with locking screws, sliding tip with locking nut.
- Temperature: -40 degrees C to 85 degrees C.
- Base pipes: aluminum construction, black finish color to discourage ice buildup; UV-resistant finish; architectural-anodization process #801; 1.5-inch diameter.
- Coil: wound with copper enameled wire in white vinyl shrink tubing, 2-inch diameter.
- Adjustable tip: stainless steel with locking nut, adjustable for SWR optimization, 0.5-inch diameter.

## Antenna System Specifications *(continued)*

- Includes written documentation of safe RF exposure distance per ANSI/IEEE C95.1-1992 standard by a professional engineer (PE).

### Lightning Arrestor System

- Capacity: 50,000 amps surge.
- Clamping speed: less than 2.5 nS.
- Connectors: UHF (2).
- Ground connection: aluminum flange.

### Groundplane

- Quantity: single PowerPlane Groundplane System, patented.
- Radials in system: 60 to 120 (specifications vary with frequency of antenna).
- Radial length: 10 to 20 feet each (specifications vary with frequency of antenna).
- Radial size: #12 bare solid copper wire.
- Bonding method: silver solder brazing with double weather resistant coating.
- Bonding ring size: #4 bare stranded copper wire.
- Lead: #4 bare stranded copper wire, 10 feet.

# Vertical Profile Antenna System™ Specifications

## Optional

When space is at a premium and station operation is unattended, the patented Vertical Profile Antenna System (VP9000) offers the solution. Place the VP9000 System in the area adjacent to the outdoor cabinet where the HAR equipment is located. The Vertical Profile Antenna System is designed to withstand hurricane wind speeds encountered on the Gulf and Atlantic coasts.

The Vertical Profile Antenna System is comprised of an attractive painted aluminum antenna support pole and antenna grounding system, all in one. The antenna lightning arrester and all cable are inside the pole, accessible through a service hatch. There is nothing on the surface of the support pole to encourage vandalism.

### Advantages

This antenna system is recommended for high visibility areas and features low vandalism potential and low installation cost.

VP9000 is engineered to and compliant with ANSI/TIA standards (ANSI/TIA-222-G-2005 Class III, Category 4, Exposure D), rated to perform in worst-case environments such as unobstructed shorelines in hurricane-prone areas and atop ridges in terrain where wind speeds can achieve great force. Additionally, it is rated for essential communications in critical areas where failure of a structure could damage buildings or present a hazard to life. To achieve these designations, the VP9000 has to be able to sustain 130 mph winds (and up to 150 mph in a 3-second gust) without failure. The Vertical Profile Antenna System is compliant with these ANSI/TIA standards for frequencies 1400-1700 kHz when installed in normal kinds of soil. Example: a 1700-kHz antenna used on the Lake Ponchartrain Causeway in New Orleans stood throughout Hurricane Katrina. Not only did this antenna survive Katrina, but so did the four antennas at the Port of New Orleans; and they operated throughout the hurricane flawlessly.

### Installation Requirements

Installation Requirements: Placement of the Vertical Profile Antenna is a minimum of 50 feet from building in grass, dirt or paved areas. See separation diagram. Vehicles may be parked next to the system; however, the support pole should be guarded from vehicle damage. Coaxial cable to the support pole may be buried or installed overhead. The pole is set in a 6-foot post hole with good earth contact in the lowest 4 feet of the hole. (When used on AM frequencies below 1000 kHz, a 20-foot solid ground rod is driven beside the pole.) Concrete, asphalt or tamped dirt may surround the pole within 2 feet of the surface.

### Signal Booster

Our optional 2x Signal Booster doubles efficiency/range of the station's antenna, allowing the transmitter to run at less wattage or allowing the signal to have twice the signal intensity at a given distance. It functions with upper-band (typ:1610-1700) antennas only and is recommended for federal government agencies that do not have a signal intensity limitation; also for any operator in a challenging environment that requires maximum signal intensity to cut through woods, buildings and obstructions. (Note: local government licensees must seek a waiver of the FCC rules to allow a signal intensity above the standard 2.0 mV/m limitation.)

## Vertical Profile Antenna System Specifications *(continued)*

### Specifications

- Space requirement: less than 1 square foot.
- RF grounding element: 4-foot length; integral to support pole.
- Lightning ground: 8-foot ground rod, copper clad.
- Support pole composition: aluminum, 6-inch OD, .25-inch wall thickness.
- Support pole length: 24 feet.
- Support pole finish: powder coat, silver/gray.
- Support standing height: 18 feet above grade; 6 feet below grade.
- Wind: hurricane rated. 1600-1700 kHz, support pole exceeds Florida Dade/Broward County wind load requirements with attached antenna, greater than 146 MPH/3-second gusts. 530-1590 kHz, support pole meets and exceeds Florida wind load requirements with attached antenna, 130 MPH/3-second gusts. (Florida Building Code – 2001).
- Internal components: RF lightning arrestor, grounding bus, coaxial feed line.
- External components: threaded attachment for antenna mount, weatherproof service hatch with tamperproof hardware.
- Frequencies: 530-1700 kHz.
- Compliant with ANSI/TIA-222-G-2005 standard (Class III, Category 4, Exposure D) when installed in normal soil conditions for frequencies 1400-1700 kHz.

# FAS6000™ Flashing Beacons and Controller Specifications

## Optional

The FAS6000 Flashing Beacons and Controller allows an operator to turn on or off a pair of flashing amber beacons on highway signs through wireless means – without compromising the AM broadcast signal. The FAS6000 Controller includes a solar-power collection-and-storage system, receiver, two amber 8" or 12" LED flashing beacons for minimum maintenance, weatherproof enclosure, mounts, wiring and instructions.

The FAS6000 Flashing Beacons and Controller system can recognize multiple on/off codes, allowing each sign to obey commands shared with other signs in the area. In this way, common groupings of flashing signs may be keyed on or off quickly in emergency situations.

Wireless control methods include UHF/VHF radio, commercial paging, cellular SMS, wireless Ethernet and cellular DTMF. Land-based methods include Ethernet/LAN and telco landline. See below.

Eight-inch or twelve-inch LED beacons are rated for more than 100,000 hours of continuous operation. The sealed-gelled cell battery auto-disconnects at low voltage to preserve integrity. FAS6000's 64-watt unbreakable solar panel and charging system allows many hours of operation per day without tapping into battery reserves. FAS6000 batteries provide approximately 60 hours of continuous dark operation. The solar charging system adds an additional 3 to 15 hours of operation per day, on the average, varying with location and season.

The FAS6000 Flashing Beacons and Controller does not include sign panels, unless optioned..

Control Methods Comparison						
Method	3rd-Party Carrier	Requires Existing Infrastructure	Controls Signs Individually or in Subgroups	Controls Signs via Web GUI	Status Feedback Is Provided	Added Hardware Costs
UHF/VHF Using DTMF 2-Tone	No	Yes, Requires UHF/VHF Coverage at Sign Locations on Available Frequency	Yes	No	No	No
Commercial Paging	Yes, Flat Monthly	No	Yes	With Additional Software	No	No
Cellular SMS	Yes, per Location	No	Yes	Yes	Yes	No
Ethernet LAN or Wireless	Yes, only if 3rd-Party LAN or Wireless Provider Is Used	Yes, Network Must Be Accessible at All Sign Locations	Yes	Yes	Yes	Yes, if Wireless
Cellular DTMF	Yes, per Location	No	No	No	No	Yes

## **FAS6000 System Specifications** *(continued)*

### **Cabinet**

- NEMA4, fiberglass; gasketed, weatherproof with equipment panel and I-beam or wood post mounts; vented design; key lockable.
- Dimensions: approximately 24 inches by 24 inches by 14 inches.

### **Receiver**

- Time and date stamping of messages.
- Pocsag or Flex available. (Flex is a Motorola trademark.)
- 9-15 volt DC operation.
- Large CAP code capacity.
- Physical (WxDxH) 20x70x30mm.
- Parallel printer output (Centronics).
- Serial data output (2nd port optional).
- 4 relays switching 12V 1A (optional).
- All frequency bands available (VHF, UHF, 900 MHz).
- External aerial on BNC connector.
- Text search and replace.

### **Beacons**

- Two amber LED signals with parallel wiring pattern, 8-inch diameter. (12-inch is optional.)
- Internal faceting that minimizes maintenance (cleaning).
- Flashers (1fps) wig-wag format.
- Includes top-of-conduit mounts with pan adjustment.

### **Power Source**

- AC: 120V AC single phase, 50/60 Hz.
- Solar: 64 watt, unbreakable solar panel; 20A charge controller with low voltage disconnect, LED indicators, adjustable-angle mast mount.

### **Battery**

- 85 AH, 12V gelled cell battery.

## Planning Steps

### Step 1: Conduct a frequency search.

Order a frequency search. Just [email us](#) the general area where the radio station(s) might be located. The per-location cost includes the license-application work, once you decide to move forward. We will develop a list of AM frequencies available and send them to you with our suggestions and instructions on how to monitor them. [See cost and other details for FCC services on this webpage.](#)

### Step 2: Survey onsite listening.

Survey the highways where listening is required with an automobile digital AM radio tuned to your candidate frequencies. Monitor all the candidate frequencies throughout the listening areas at least once during daylight hours and at least once after dark. [Report your results to us on the frequency-monitoring form.](#) (See [Why Nighttime Monitoring Is Important.](#))

### Step 3: Choose a general location for coverage.

On a local map, find the approximate geographic center of the listening area you want to cover. The HAR signal will propagate to a radius of 3-5 miles from this point in all directions. If this coverage does not encompass the highways that require coverage, consult with us regarding adding satellite stations. If a specific highway or intersection is critically important to cover, consider locations within ½ mile. Mark the map to show the area within which the antenna should be located to meet your coverage goals. Consider where signs will be placed to announce to motorists entering the area that the signal is available.

NOTE: We do not recommend installing antennas on rooftops or within 50 feet of buildings that contain electronics because of the potential for interference and equipment damage. This does not apply to non-building oriented situations such as isolated-style installations in which a cabinet with the electronic equipment is attached to the antenna support pole.

### Step 4: Determine the desired National Weather Service 'All Hazard' coverage.

Verify reception of a National Weather Service channel (162.400-162.550 MHz) at the desired location. See coverage areas online at this [NOAA web link](#).

### Step 5: Choose a specific antenna location.

For best coverage, the immediate location should be free of objects that exceed 25 feet (about 2 stories.) This includes tall buildings, trees, terrain features, lighting, power and communication poles and towers, overpasses and highway signs. Make certain 120VAC power and telephone service are available at the site and that there is a 40'-by-40' area of open ground for cabinet and antenna installation. A conventional, vertical profile or super antenna system may be used. Consult with us for assistance.

### Step 6: Fill out the FCC license applications questionnaire.

Complete a FCC License Questionnaire found on [this webpage](#) that gives us the information needed to prepare and submit the 10-year FCC license application on your behalf. On the questionnaire, you will be asked to provide information on your antenna operating area, your frequency choice and required names and addresses. The FCC typically takes 3 to 6 months to process authorize it. While waiting for the 10-year license to be granted, you may procure the equipment and build the station, if you wish.

## Planning Steps *(continued)*

IMPORTANT: You must have a FCC license in hand to operate; the station must be on the air within 12 months of the license grant date, or the authorization will expire. Special Temporary Licenses (STA) might also be available from the FCC, if immediate operation is required.

NOTE 1: Because FCC processing time is unpredictable, we recommend you request licensing and other FCC documentation services as soon as you know for sure you will have a station – definitely no later than when you place your radio equipment order.

NOTE 2: The FCC considers 10-year, renewable licenses for Information Radio Stations secondary to full-power broadcast stations. This means, that in a rare situation in which a full-power station might move into a given area, an advisory radio station already in that vicinity might need to change frequency. We can assist.

### **Step 7: Consider equipment, options and services.**

Many options are available to customize the HAR for your application:

Consider, for example, extra backup batteries so each station remains operational if AC power goes out. If the station is in an unattended location, also consider getting a Power Loss Notification Module.

If you want to notify motorists that critical messages are being broadcast, ask about the FAS6000 Beacons and Flash Controller for highway signs that may be triggered via pager or two-way radio.

Phone-based NX8R audio control is standard. You might want to consider IP76 for added flexibility.

If vandalism is an issue, our Vertical Profile Antenna System is an option.

If more than one station is needed, GPS Frequency Stabilization to minimize interference among satellite stations.

Consider whether you need a Signal Measurement Receiver for ensuring FCC compliance of your signal long term.

Planning assistance is free. [Email](#) (or call 616.772.2300 x102) us. We can provide a formal quotation. Just let us know:

- ✓ Your name, agency, phone and fax numbers, email address, if desired.
- ✓ Product name: ITS6000 Highway Advisory Radio Network.
- ✓ Options desired.

### **Step 8: Prepare your transmitter site.**

We provide detailed, illustrated instructions on how to prepare your transmitter site, based on the antenna system you choose. This allows you to prepare the site yourself; subcontract the work; or, if you prefer, [request a quote for installation services for your configuration.](#)

## Terms

Terms ISS prepays the ground freight within the 48 contiguous United States if the total of the order before tax exceeds \$2,500. Freight to Alaska and Hawaii bears an additional charge. The product is typically available for shipment 30-60 days after ISS receives an order and the equipment configuration information is provided. Terms are net 30 days to government entities and their agents; check-with-order for initial orders from private-sector entities. ISS reserves the right to invoice for equipment separately from labor items. Prices are valid 180 days from the quotation date. The warranty term on ISS products, including computers and software, is one year from the date of delivery or ISS installation, whichever comes later, unless otherwise stated in writing. Full warranty is available upon request. The warranty is void should the configuration of components, hardware or software, including the total system, be modified (or modified with respect to the operating environment) subsequent to delivery. Purchases are subject to "Standard Terms and Conditions," an agreement to be signed.

## Quote

Bill Baker (bill@theRADIOsource.com, phone 616.772.2300, extension 102) can provide a formal quote based on your application(s). An illustrated instruction manual comes with each system; and, when optioned, ISS provides remote technical support 24 hours a day, 7 days a week, for the life of your ISS system. Visit [www.theRADIOsource.com](http://www.theRADIOsource.com) or scan the below QR tag with your phone to go directly to the product webpage.

Founded in 1983, Information Station Specialists is the nation's best known source for information radio stations (TIS/HAR), advisory signs and the specialized services required to transmit spoken messages to citizens. ISS is the only such source providing products entirely made in America.

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Patents: Factory-Assembled PowerPlane Groundplane & Vertical Profile Antenna System