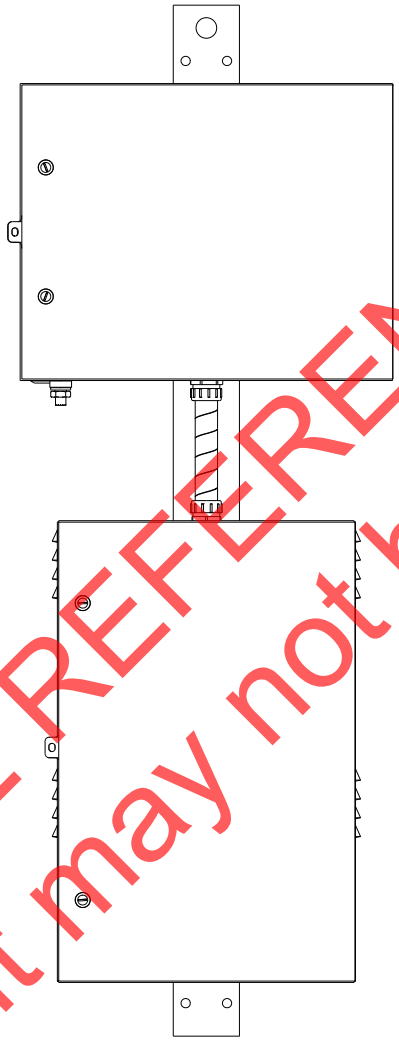
Federal Signal UltraVoice™ Electronic Siren Controllers



Control Unit / Battery Box

INSTALLATION and OPERATION INSTRUCTIONS

255354Q
REV. Q1 809

SAFETY NOTICES

People's lives depend on your selection of suitable equipment and installation sites and your safe installation, service, and operation of our products. Federal Signal recommends the following publications from the Federal Emergency Management Agency for assistance with planning an outdoor warning system: 1. The "Outdoor Warning Guide (CPG 1-17), 2. "Civil Preparedness, Principles of Warning" (CPG 1-14), 3. FEMA-REP-1, Appendix 3 (Nuclear Plant Guideline), and 4. FEMA-REP-10 (Nuclear Plant Guideline). Contact Federal Warning System's Customer Care Center at: http://www.federalwarningsystems.com or 1-800-524-3021 for further information about these publications.

It is important to read, understand and follow all instructions shipped with this product. In addition, listed below are some other important safety instructions and precautions you should follow.

PLANNING

- If suitable warning equipment is not selected, the installation site for the siren is not selected properly or the siren is not installed properly, it may not produce the intended optimum audible warning. Follow Federal Emergency Management Agency (FEMA) recommendations.

- If sirens are not activated in a timely manner when an emergency condition exists, they cannot provide the intended audible warning. It is imperative that knowledgeable people, who are provided with the necessary information, are available at all times to authorize the activation of the sirens.

- When sirens are used out of doors, people indoors may not be able to hear the warning signals. Separate warning devices or procedures may be needed to effectively warn people indoors.

- The sound output of sirens is capable of causing permanent hearing damage. To prevent excessive exposure, carefully plan siren placement, post warnings, and restrict access to areas near sirens.

- Activating the sirens may not result in people taking the desired actions if those to be warned are not properly trained about the meaning of siren sounds. Siren users should follow FEMA recommendations and instruct those to be warned of correct actions to be taken.

- A siren that does not work will not provide any warning. After installation, service, or maintenance, test the siren system to confirm that it is operating properly. Test the system regularly to confirm that it will be operational in an emergency.

- If future service and operating personnel do not have these instructions to refer to, the siren system may not provide the intended audible warning and service personnel may be exposed to death, permanent hearing loss, or other bodily injury. File these instructions in a safe place and refer to them periodically. Give a copy of these instructions to new recruits and trainees. Also give a copy to anyone who is going to service or repair the siren.

SAFETY NOTICES

People's lives depend on your safe installation, service and operation of our products. It is important to read, understand and follow all instructions shipped with this product. In addition, listed below are some other important safety instructions and precautions you should follow:

INSTALLATION & SERVICE

- Electrocution or severe personal injury can occur when performing various installation and service functions such as making electrical connections, drilling holes, or lifting equipment. Therefore experienced electricians in accordance with national, state and any other electrical codes having jurisdiction should perform installation. All work should be performed under the direction of the installation or service crew safety foreman.

- The sound output of sirens is capable of causing permanent hearing damage. To prevent excessive exposure, carefully plan siren placement, post warnings and restrict access to areas near the sirens. Sirens may be operated from remote control points. Whenever possible, disconnect all siren power including batteries before working near the siren.

- After installation or service, test the siren system to confirm that it is operating properly. Test the system regularly to confirm that it will be operational in an emergency.

- If future service personnel do not have these warnings and all other instructions shipped with the equipment to refer to, the siren system may not provide the intended audible warning and service personnel may be exposed to death, permanent hearing loss, or other bodily injury. File these instructions in a safe place and refer to them periodically. Give a copy of these instructions to new recruits and trainees. Also, give a copy to anyone who is going to service or repair the sirens. For additional copies, call the Federal Warning Systems Customer Care Center at 800-524-3021 or write to them at 2645 Federal Signal Drive, University Park, IL 60466.

OPERATION

- Failure to understand the capabilities and limitations of your siren system could result in permanent hearing loss, other serious injuries or death to persons too close to the sirens when you activate them or to those you need to warn. Carefully read and thoroughly understand all safety notices in this manual and all operations-related-items in all instruction manuals shipped with equipment. Thoroughly discuss all contingency plans with those responsible for warning people in your community, company, or jurisdiction.

Limited Warranty

The Federal Warning Systems Division of ***Federal Signal Corporation*** *warrants each new product to be free from defects in material and workmanship, under normal use and service, for a period of two years on parts replacement and factory-performed labor (one year for Informer, EAS, and Federal software products) from the date of delivery to the first user-purchaser. Federal Warning Systems warrants every 2001 & Eclipse Siren (Top of pole only) to be free from defects in material, per our standard warranty, under normal use and service for a period of five years on parts replacement.*

During this warranty period, the obligation of Federal is limited to repairing or replacing, as Federal may elect, any part or parts of such product which after examination by Federal discloses to be defective in material and/or workmanship.

Federal will provide warranty for any unit which is delivered, transported prepaid, to the Federal factory or designated authorized warranty service center for examination and such examination reveals a defect in material and/or workmanship.

This warranty does not cover travel expenses, the cost of specialized equipment for gaining access to the product, or labor changes for removal and re-installation of the product. The Federal Signal Corporation warranty shall not apply to components or accessories that have a separate warranty by the original manufacturer, such as, but not limited to, batteries.

Federal will provide on-site warranty service during the first 60-days after the completion of the installation, when Federal has provided a turn-key installation including optimization and/or commissioning services.

This warranty does not extend to any unit which has been subjected to abuse, misuse, improper installation or which has been inadequately maintained, nor to units which have problems related to service or modification at any facility other than Federal factory or authorized warranty service centers. Moreover, Federal shall have no liability with respect to defects arising in Products through any cause other than ordinary use (such as, for example, accident, fire, lightning, water damage, or other remaining acts of god).

THERE ARE NO OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL FEDERAL BE LIABLE FOR ANY LOSS OF PROFITS OR ANY INDIRECT OR CONSEQUENTIAL DAMAGES ARISING OUT OF ANY SUCH DEFECT IN MATERIAL WORKMANSHIP.

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SECTION I
GENERAL DESCRIPTION

1.1 Introduction

The UltraVoice controller is another Federal Signal innovation in siren control and battery operated amplification systems. A single high-powered computer based control board controls and monitors all siren functions minimizing wiring and increasing reliability. The modular UltraVoice siren controller replaces the previous Federal Signal MCP series of electronic siren controllers.

Features

- Seven standard warning signals
- Up to 16 digitally stored voice messages – 4 minutes total recording time (optional)
- Local pushbutton control
- 8 remote contact closure inputs for activation
- Single tone, two-tone, DTMF, MSK, EAS & POCSAG decoders for remote siren control
- DTMF or MSK encoders for remote status monitoring
- 600Ω I/O for wire line control and status monitoring
- Serial port control, for wire line control and status monitoring
- 15A relay output
- Quiet Test - siren status monitoring
- Zoning - up to 8 zones per control cabinet for selective control of speaker outputs
- Power Control to ramp up siren volume for added safety and for low power testing
- Stackable siren functions enable user pre-defined warning scenarios
- Programmable radio receiver for Low Band, VHF, or UHF (optional)
- Windows® based siren programming software (optional)
- Programmable over wireless radio channel using SFCDWARE
- Modular design - no inter-board wiring, easy field service
- Programmable volume control

The UltraVoice is designed around a card cage configuration. The card cage has a capacity of ten plug-in highly integrated cards consisting of: one controller position, one optional accessory position and eight amplifier positions. Each amplifier card consists of a 400-watt amplifier designed to drive any combination of speaker drivers up to 400 watts. Depending on the number of amplifier cards installed, eight power levels are available from 400 to 3200 watts.

Activation codes, command sequences and operating parameters are uploaded from an IBM compatible computer through the RS232 port located on the front panel or over the radio channel with the Federal Commander Digital System. All user information is stored in EEPROM non-volatile memory immune to power and battery failure.

The Control Unit consists of two cabinets, which are bolted to a mounting channel for ease of installation. The upper cabinet (NEMA 4 enclosure) houses all the necessary electronics and controls for producing and amplifying siren signals. The amplifiers and optional equipment are all modularly constructed for easy removal without disconnecting a large number of wires. In most instances field service is limited to replacement of a slide out module; which can be performed by non-technical personnel with only a screwdriver.

The lower cabinet, which is a vented NEMA 4 style cabinet, houses user provided maintenance free, lead-acid deep-cycle rechargeable batteries. The cabinet houses up to four batteries depending on the number of amplifiers used. The lower and upper cabinets are interconnected via conduit, which is sealed to prevent any harmful vapors from entering the control area. The batteries in the lower cabinet provide primary power to the siren, while the charger in the upper cabinet maintains the charge of the batteries. The batteries will continue providing power to the siren controller for at least seven days in the event of an AC power failure.

The UltraVoice controller uses common parts for all siren control applications. The only variables are the amount of amplifiers and batteries required. The model UV400 (400-watt amplifiers) are not included in the UltraVoice models because the type of speaker array that will be used determines their quantity. Refer to the tables below to determine the UltraVoice model and quantity of amplifiers to order for each UltraVoice controller and siren combination. For example: order (3) UV400 amplifiers with a MOD3012 siren.

CONTROLLER OPTIONS	ULTRAVOICE MODEL #
NO RADIO (RF)	UV
HIGH BAND RF	UVH
LOW BAND RF	UVL
UHF BAND RF	UVU
2-way Radio ready VHF Radio UHF Radio (120 VAC)	UVT UVTH UVTU
Digital 2-WAY Radio ready VHF Radio UHF Radio (120 VAC)	UVTD UVTDH UVTDU
Digital 2-WAY VHF UHF Radio (240 VAC)	UVTD240 UVTDH240 UVTDU240
Digital 2-WAY Broadband	UVTD-IP

Contact your sales representative for stainless steel options.

- For DSA series sirens, the total number of speakers to be used with each UltraVoice controller must be determined. Each DSA model number is based on the quantity of speakers it contains. Since each speaker is a 100W speaker, the quantity of amplifiers can be determined using the tables below.

For example: If (4) DSA2 arrays are used with (1) UltraVoice controller, 4 x 200 watts = 800 watts or (2) UV400 amplifiers

UV400 AMPLIFIER SELECTION CHART FOR MOD SERIES SIRENS
(see paragraph below for DSA speakers)

QTY	SIREN TYPE	TOTAL POWER
(1) UV400	MOD1004	400 watts
(2) UV400	MOD2008	800 watts
(3) UV400	MOD3012	1200 watts
(4) UV400	MOD4016	1600 watts
(5) UV400	MOD5020	2000 watts
(6) UV400	MOD6024	2400 watts
(8) UV400	MOD6032	3200 watts
(12) UV400	MOD6048	4800 watts

DSA POWER RATING CHART

MODEL	TOTAL POWER
DSA1	100 watts
DSA2	200 watts
DSA3	300 watts
DSA4	400 watts
DSA5	500 watts
DSA6	600 watts

Notes: 1. Each UV400 amplifier is a 400-watt amplifier. Therefore, consult the chart above to determine how many amplifiers are required to drive DSA siren combinations. DSA speakers must be used in 400W increments with UV400 amplifiers.

1.2 Configuration

Each modular UltraVoice siren contains the following configuration parameters that are configured by the user:

1. Unit Type
2. Unit Address (see below)
3. RF Frequency
4. Single-Tone or Two-Tone Timing (A-time, B-time, S-time)

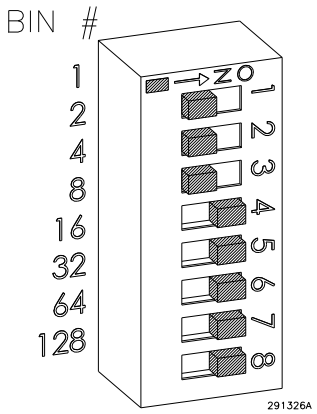
Unit Type:

The Unit Type is set to the type of siren this unit is controlling, and is usually determined by the number of cells in the speaker array. When setting up the unit type, the user selects from a menu with the following choices:

EOWS-612	Directional Siren
UV with 1 amp	1-Cell - 400W siren
UV 2 amps	2-Cell - 800W siren
UV 3 amps	3 Cell - 1200W siren
UV 4 amps	4 Cell - 1600W siren
UV 5 amps	5 Cell - 2000W siren
UV 6 amps	6 Cell - 2400W siren
*UV 8 amps	6 Cell - 3200W siren
*UV 12 amps	6 Cell - 4800W siren

*(2 controls and 2 battery cabinets req.)

Site Address Switch:
Unit Address



The unit address sets the siren site number and is used to identify the site in two-way report back systems. The Unit Address is a three-digit number with a range of 001-255. The unit address is set via dip switch S1. S1 Off position indicates active position. Add binary active switch positions to get ID address.

Switch number	1	2	3	4	5	6	7	8
Binary number	1	2	4	8	16	32	64	128

Example: Switch number 1, 2 & 3 is binary number 1, 2 & 4, which when added, would equal unit address 7.

Note: Must be set to address one to program controller board with hex code or to program a non-digital unit. When the programming is completed, change the dip switch setting to the actual site address. Programming details are in the software manual. The ID address is stored at power up of the controller. If the ID address is changed, the power (battery and AC) must be turned off and then on.

RF Frequency

For units equipped with the optional integral radio receiver, the RF Frequency configuration parameter sets the frequency of the radio channel. Changing this parameter from its factory setting will require re-alignment of the radio for maximum performance. The value entered must fall within the range specified for the receiver band equipped.

Single-Tone, Two-Tone Timing

For Two-Tone activated units, the Two-Tone Timing parameters set up the time duration of the activation tone codes. The three parameters, A-Time, B-Time and S-Time; sets the time duration for the A-tone, B-tone and Single-Tone respectively. Note: the Two-Tone timing parameters are minimum values only. The actual tone times may be longer than the specified times.

1.3 User Programs

The modular UltraVoice siren has the capacity to store up to fifty (50) user programs. Each user program contains the following elements:

1. DTMF Activation Code OR
2. Two-Tone Activation Code OR
3. EAS Location & Event Codes OR
4. POCSAG Activation Code OR
5. Digital Activation Code # AND

6. List of up to 20 functions

The ability to assign more than one function to each activation code or user program is a new feature not previously found in electronic sirens. This allows the user to run a sequence of functions without sending additional activation commands, greatly enhancing flexibility while reducing operator involvement and communication channel traffic.

Available Functions:
Arm
Disarm
Report
Master Reset
Cancel
PA Output
Quiet Test
Low Power Mode
Hi Power Mode
Zone A (rotating sirens only)
Zone B (rotating sirens only)
Zone C (rotating sirens only)
Zone D (rotating sirens only)
Wail
Pulsed Wail
Alt Wail
Steady
Pulsed Steady
Alt Steady
Auxiliary (Chime)
Delay
Digital Voice (1-16)
Zone Control
Power
Report

Low Power Mode, Hi Power Mode:

This causes the siren to operate at a greatly reduced volume level. Upon activation of a user program, the siren defaults to Hi (normal) volume level. This command must follow an ARM command. Reduced volume mode will remain in effect for all subsequent functions in a user program that follow the Low-Power function or until a Hi-Power function occurs or an ARM command is sent.

Delay

The delay function causes the siren to pause (wait) for 2 - 512 seconds before starting the next function of the user program currently running. When selecting the delay function, the user will be prompted to enter the desired delay time in seconds. A default delay of 4 seconds is present between functions, without adding a delay.

Zone Control

The Zone function allows the user to control which amps are to operate.

This allows the user great flexibility in building alerting or other zone dependent systems. Each UltraVoice electronic siren controller has the capability to be divided into eight different zones. When selecting the Zone function, the user is prompted to enable or disable each of eight possible zones, corresponding to each amplifier in the siren. Upon activation of a user program, the siren defaults to all zones enabled. The ZONE command must follow an ARM command. Zoning will remain in effect for all subsequent functions in a user program that follows the zone function or until

another ZONE or ARM function occurs.

1.4 Programming Methods

There are two methods of entering and reviewing the user programming information in an UltraVoice electronic siren controller:

1. FSPWARE Windows® based programming software for 2-tone and DTMF controlled systems. This software requires a direct connection between the siren and the computer's RS232 port.

2. SFCDWARE Windows® based digital control and status monitoring software. This software may be used over a landline or wireless radio channel as well as over an RS232 port.

Detailed information on the operation of the WINDOWS® program is beyond the scope of this document and can be found in the software's Help file.

Power Level

The Power function allows the user to control the volume level. The volume can be adjusted from 0 to -20 dB in 1 dB steps. Reduced volume mode will remain in effect for all subsequent functions in a user program that follow the Power function, or until another Power function occurs, or an ARM command is sent.

1.5 Status Monitoring:

The UltraVoice siren controller monitors various diagnostic conditions for reporting back to a central monitoring station using optional control and status monitoring hardware and software.

Status items monitored:

- Siren Type
- Function State (code running)
- Unit ID
- Amplifier status for each amp in the unit depending on siren type*
- Audio A*
- Audio B*
- Master Current*
- Battery *
- Charger
- AC Power
- Control Box Intrusion
- Battery Box Intrusion
- False Alarm/Local Activation*
- Rotation*

*Latched Items -- remain set until reception of a Reset command or another function is run.

Status information is transmitted either as a DTMF or FSK data string over the communications channel and as an ASCII string over the RS232 port. Report back transmission will occur when one of two conditions exist:

1. Reception of a REPORT command or

2. One of the asynchronous status conditions changes state.

SECTION II
SPECIFICATIONS

2.0 Electrical

Input Voltage	120 or 240 VAC 50 - 60 Hz* (*two separate models)
Input Current	7 amps maximum
Battery Input Voltage	20-28 VDC 24 volts (nominal)
Battery Current	120 mA standby current, +18 - 22 amps for each amplifier module running
Maximum Signaling Time	30 minutes
Stand By Time (with minimum 5-minute full signal reserve)	Greater than 168 hours (7 days) without 2-way radio

2.1 Charger

Current Limit	Protected with automatic recovery
EMI/RFI Filtering	Meets FCC requirements
Input	115 VAC (50 - 60 Hz), 3.5A maximum
Output Voltage	26 – 30 VDC (temperature compensated)
Output Current	0 -10 amps DC

2.2 Battery

Battery Voltage (72°F) 27.2 VDC nominal

Recommended Batteries:

For 1-3 amplifiers (UV400):
Quantity 2
Type: DELCO VOYAGER M24MF or DELCO 2000 required

For 4 amplifiers (UV400):
Quantity 2
Type: DELCO 2000 required

For 5-8 amplifiers (UV400):
Quantity 4
Type: DELCO VOYAGER M24MF or DELCO 2000 required

TABLE 2.1: Average Battery Temperature Values

Battery Temperature	Approximate Float Voltage
15°F / -9.4°C	29.40
20°F / -6.7°C	29.22
30°F / -1.1°C	28.84
40°F / 4.4°C	28.48
50°F / 10.0°C	28.12
60°F / 15.6°C	27.74
70°F / 21.1°C	27.38
80°F / 27.0°C	27.00
90°F / 32.2°C	26.64

NOTE:
Batteries are to be user supplied.

2.3 Serial & I2C Ports

Serial Port Protocol	RS232C 1200,N,8,1
I2C Port Protocol	Philips Standard I^2C

2.4 Radio Communication

Receiver Module (UVL, UVH, UVU)

Frequency Range	30 - 50, 151 - 168, 450 - 470 MHz
Frequency Stability	-30°C to 65°C +/- 5ppm for UHF, +/- 15ppm for High Band +/- 30ppm for Low Band
Channel Spacing	30 kHz or 12.5 kHz LB and HB, 25 kHz or 12.5 kHz UHF
Sensitivity	Less than 0.35 uV for 12 dB

SINAD

Selectivity	-70 dB at +/- 30 kHz
Spurious Rejection	-70 dB
Image Rejection	-70 dB
Modulation Acceptance	7.5 kHz or 3.5 kHz (narrowband)
Antenna Acceptance	50 ohms
Decode Sensitivity	No more than 0.5 uV for tone @ 3 kHz deviation (except w/ TCSS tones > 200 Hz & decode tones < 400 Hz) and 0.5 uV for DTMF with 50 ms/ 50 ms or greater timing
Squelch Sensitivity	Minimum squelch setting = Open Squelch w/ 1 kHz tone @ 3 kHz deviation maximum squelch setting = < 30 dB SINAD

2.5 Signaling Format

Number of codes	Up to 50 activation codes maximum
Two-tone sequential or single tone	282 Hz - 3000 Hz A=0.5 and B=0.25 seconds minimum to 8 seconds maximum Single tone=0.5 seconds minimum to 8 seconds maximum
DTMF	3 to 12 digits standard
EAS/SAME	520.83 (6250/12) bits per second, 2083.3Hz mark tone 1562.5 Hz space tone
POCSAG	Binary frequency shift keying (FSK) Data speed is 512, 1200, or 2400 bits/s
AFSK	1200,N,8,1 (MSK Type)
Number of functions allowed stacked under each code	Up to 20
Two way Formats	Federal Packet Digital & DTMF

2.6 Relay Output

Contact Rating	30 VDC, 15A

2.7 600 Ohm Balanced Line Port

Audio Input Level	0.10 to 2 volts peak to peak to make 1 volt peak to peak at TP10
Audio Output Level	0.25 to 2.0 volts peak to peak
Protection	

2.8 Remote Activation, Sensor and Direction Inputs

Number of Remote Activation Inputs	8
Number of Remote Sensor Inputs	4
Number of Direction Sense Inputs	4

Input Type	Optically Isolated activated by Dry Contact closure < 2 kOhms

2.9 Front Panel Controls, Jacks, Switches and Indicators

Jacks:

MIC J1	10 k ohms input impedance, 50 mV nominal input level
RADIO JP6	External receiver or transceiver
• Receive audio input	150 mV to 3 volts peak to peak. Receive audio level required to make 1 volt peak to peak at TP10
• Transmit Audio Output	50 mV to 3 volt peak to peak
• Carrier Detect Input	Less than 1 volt DC to make active
• PTT Output	Active low, will sink 500 mA maximum
• 12VDC	+/- 0.2 volts, 1.0 amps maximum
• Ground	1.5 amps maximum current capacity
RS232 Serial Port P1	RS232 standard, 1200 baud,N,8,1
RX test TP10	Receive audio test point. Set to 1 volt peak to peak

Controls:

DV GAIN	Volume adjustment for digital voice option. Internal Digital Voice level sufficient to drive TP1 or TP2 into clipping.
TX GAIN	Transmitted audio adjustable from 50 mV to 1 volt peak to peak (p-p)
REC GAIN	Received Audio level 150 mV - 3 volts p-p
MIC GAIN	Local PA level range sufficient to drive amplifiers into clipping w/50 mV nominal input level

Manual Activation Switches: Activate with a hold time > 0.50 seconds

Indicators

RXD	Receive serial data & receipt of radio channel modulation.
TXD	Transmit serial data & DTMF & digital
AUDIO A	Audio present on channel A
AUDIO B	Audio present on channel B
ARM	Unit Armed indicator
PA	Public Address mode indicator
CPU	Microprocessor heartbeat
CARRIER	RF Carrier indicator ON w/carrier present

2.10 Expansion Slot

The expansion slot contains the same connector pin-out as the Controller slot.
Signals Available:

Two I2C Ports
600 Ohm Balanced Port
+5 VDC
+24 VDC
PTT
AUDIO-A and AUDIO-B
Open-Collector Output (for Rotator Relay)
Charger Indicator
4 Remote Sensor Inputs
8 Remote Activation Inputs
4 Direction Sensor Inputs

I^2C

JP18 & JP19

5 volts peak-to-peak +/- 1 volt input
5 volts DC +/- 0.2 volts 250 mA
Ground 250 mA maximum sink

2.12 Audio Output to Amplifiers

Output voltage swing	> 9V peak to peak +/- 3dB
Maximum load	600 ohms
Total harmonic distortion	< 10% w/1 kHz sinewave
Duty cycle (Built in signal generator)	1-255 seconds (user programmable)

2.13 Audio Power Amplifier Modules Model (UV400)

Input voltage	24 VDC nominal 28 VDC maximum
Input current siren mode	@ 24 VDC w/1 kHz squarewave into 11 ohms: < 20 amps
Input current voice mode	@24 VDC w/1 kHz tone set to 67 Vrms into 11 ohms: < 24 amps
Standby current at amps turned off	< 10 mA
Efficiency	> 90% - siren mode > 80% - voice mode
Output voltage into 11 ohms @1 kHz and 24 VDC nominal operating voltage	67 Vrms nominal@400W - siren mode 67 Vrms nominal@400W - voice mode
Input impedance	100 k ohms
A to D sensor accuracy	< +/- 10%
Audio distortion	< 10% - voice mode – below clipping
Frequency response Power low power mode	+/- 3 dB, 300 - 3000 Hz < 5 watts per amplifier
Ripple on power supply w/all amps running at rated power in siren mode	0.5 volt peak to peak maximum

2.14 Environmental

Operating temperature	-30°C - +65°C
Humidity	0 - 98% non-condensing

Note:
The siren can operate throughout this temperature range provided the battery temperature is maintained at -18°C or higher.

2.15 Physical

UV400 amplifiers	10.5” height, 2.0” width, 8.5” depth, [26.67 cm x 5.080 cm x 21.59 cm] Weight 4.12 lbs. [1.9 kg]
Control cabinet	19.0” height, 23.5” width, 11.2” depth [48.26 cm x 59.69 cm x 28.42 cm]
Battery cabinet	28.0” height, 18.0” width, 15.2” depth [71.12 cm x 45.72 cm x 38.61 cm]
Net Weight	170 lbs. [77.13 kg]

SECTION III
ELECTRONIC SIREN CONTROL OPERATION

3.0 Hardware General Description

The modular UltraVoice Electronic Siren Controller contains a card cage with ten plug-in highly integrated boards consisting of: one controller slot, one optional accessory slot and eight amplifier slots. The number of amplifier cards can be varied from one for a 400-watt system up to a maximum of eight for a 3200-watt system. All siren control, audio generation and remote communication functions are handled by a single microcomputer controlled controller board. The back-plane (motherboard) contains connectors and terminal blocks for wireless interconnection of the other system components. To facilitate field service, no active circuitry is located on the back-plane. Power for the siren is supplied by 2 or 4 deep cycle marine batteries. AC and Solar battery charger options are available.

3.1 Manual Activation

Located on the face of the controller, the manual activation switches are used to manually activate siren functions.

Function Switch	Function
FUNC1	Activates functions under code 1
FUNC2	Activates functions under code 2
FUNC3	Activates functions under code 3
FUNC4	Activates functions under code 4
FUNC5	Activates functions under code 5
FUNC6	Activates functions under code 6
FUNC7	Activates functions under code 7
FUNC8	Reset
FUNC1 & FUNC6	Loads default speaker calibration values & transmits DTMF characters (production testing)
FUNC2 & FUNC3	Calibrate speaker load & Xmit DTMF Quiet Test
FUNC5 & FUNC7	Transmits 1200 Hz tone for radio deviation adjustment

NOTE: At any time during a sounding function the "RESET" button may be pushed to cause the unit to halt all output immediately.

3.2 Local Public Address

With the optional microphone MNC-MC, the operator has the ability to locally give a Public Address message. The PA mode can be entered simply by plugging the MNC-MC into the microphone receptacle labeled MIC on the front panel. The PA LED will be lit anytime the press-to-talk button on the microphone is depressed. Rotating sirens will start rotating to the next zone when PTT is released.

NOTE: Mic gain volume adjustment located on controller front panel.

NOTE: Local PA overrides ALL siren functions activated either remotely or locally.

3.3 Relay Output

Terminal block JP11 at the bottom of the system motherboard is the relay output. This relay closes whenever a siren function is running. In P.A. mode the relay is open while the MIC PTT button is pushed and closes when the MIC PTT button is released to enable rotating sirens to change position. Siren will rotate to next zone. Relay is not closed during remote quiet test.

3.4 600 Ohm Input

Terminal block JP12 at the bottom of the system motherboard is the 600 ohm input. This input can be used for audio input for activation of the unit as from a radio receiver or for the input of audio from an external voice storage unit. To use the 600 ohm input for activation receive audio, at JP8 a jumper must be across pins 2-3. JP8 is located on the main controller card. The 600 ohm input can receive activation audio and transmit reports to an external unit.

To use the 600 ohm input for audio from an external voice storage unit, at JP8 a jumper must be across pins 1-2. R111 can be used to control the volume level when used in this mode. Contact closure at JP15 pins 10 and 11 (PTT: Push To Talk) is required to activate audio mode. For best results, a well-filtered audio source should be used. The audio cable used should be shielded audio grade cable and the length should be kept as short as possible. Keep away from sources of electrical noise.

3.5 24 VDC Supply

24 VDC Supply used to power external equipment: fused at 10 amps

JP16 Terminal	Function
1	Ground
2	24 VDC

3.6 Remote Landline Activation

Terminal block JP14 at the bottom of the system motherboard is the Remote Activation Inputs. The electronic siren controller can optionally be operated by remote control via landline. Terminal block JP14 is used for landline control connections.

Any of the codes, which means all of the functions programmed for that code, can

be activated by providing an additional momentary, dry contact closure between “COM” and the desired JP14 terminal. Shorting “F1” to “COM” will activate whatever is programmed for code #1, shorting “F2” to “COM” will activate whatever is programmed for code #2 and so on. A half second momentary contact duration is required.

To terminate an activated signal before it runs for the full duration, if desired: Provide a momentary contact closure between JP14 “COM” and “F8” (RESET).

Remote Activation Connections:

JP14 Terminal	Function
1	“Common”
2	“F1”
3	“F2”
4	“F3”
5	“F4”
6	“F5”
7	“F6”
8	“F7”
9	“F8”
10	“Common”

3.7 Sensor Inputs

Terminal block JP15 at the bottom of the system motherboard is the Sensor Inputs. These are activated by a short to “Common”.

Sensor Connections:

JP15 Terminal	Function
1	“Common”
2	“Spare #1”
3	“Common”
4	“Intrusion”
5	“Common”
6	“Solar”
7	“Common”
8	“AC Power”
9	“Common”
10	“600 PTT”
11	“Common”
12	“Spare #2”

Intrusion: Alerts the controller when one of the unit’s doors has been opened. Low is intrusion pass

Solar: Used to sense operation of solar power system.

Jumper JP15: pins 5 to 6 and to enable solar sensing. Solar mode latches power sense to prevent low light conditions from causing failures. For solar panel test, initiate a reset, and then a poll. Immediate good power input required after a reset to pass. Jumper JP15 pins 7 to 8 AC sense is required if solar only unit.

Spare 1 & 2: Unused inputs for special functions.

AC Power: Alerts the controller when the AC Power has failed. Open is fail. Closed is pass.

600 Ohm PTT: Puts the unit in Local P.A. mode for input of external audio. Closed is active.

3.8 Isolated Supply

Isolated Supply used to power External Sensors:

JP16 Terminal	Function
1	"Isolated Supply(ground)"
2	"Isolated Supply (+5 V)"

3.9 Rotation Sensor

Terminal block JP17 at the bottom of the system motherboard is for Sensor Inputs. These are activated by a short to "Common". These inputs are only used with a rotating electronic siren. When a "Zone" function is run the speaker array rotates until the corresponding direction sensor input detects that the array is facing the proper direction. A rotation time-out-timer will stop the siren from rotating after 20 seconds if the sensor is not connected.

Rotation sensor Connections:

JP17 Terminal	Function
1	"Common"
2	"North"
3	"South"
4	"East"
5	"West"

3.10 Battery Charger

In the battery cabinet, is a smart charger, which monitors battery conditions, temperature and varies charge rate. It is a two-stage charger, charging each 12 VDC stage separately. Each stage can consist of more than one battery in parallel. See "Specifications Section," "Battery," for required quantity of batteries. The two stages of batteries add up in series, to give the 24 VDC required for controller operation.

Charger	Description	Connection
Black wire	Ground	To 1st battery stage (-)
Red wire 12 VDC	12 VDC charge 1st battery stage	To 1st battery stage (+)
Red wire 24 VDC	24 VDC charge 2nd battery stage	To 2nd battery stage(+)
Side terminal back- White wire	Charger sense output- switched voltage driven from Charger voltage input	To JP20-2
Side terminal front- Red wire	Charger voltage input-voltage to drive Charger sense output	To 200 amp fuse

Battery Charger Status – Charger Status is indicated by the LED's on the front of the Chargers. The left, 1st pair of LEDs are for 12 V and the 2nd pair is for 24 V potentials. Battery Status is as follows:
Red OFF, Green OFF = Charger OFF
Red ON, Green OFF = Charging, below 13 VDC
Red ON, Green ON = Charging, above 13 VDC
Red OFF, Green ON = Float Charging, Battery > 90% charged or Battery is disconnected from Charger.
Note: Battery Voltage will be slightly higher when the temperature is below 72°F and Voltage will be slightly lower when the temperature is above 72°F.

SECTION IV
SYSTEM PLANNING

4.0 Control Unit

The information in this section provides the user with guidelines necessary for installation.

Control Unit mounting location must first be considered. The Control Unit can be mounted indoors as well as outdoors. In order to avoid losses in speaker power, it is recommended that the speaker array and Control Unit be installed without lengthening the 40-foot interconnecting cable supplied. If it is necessary to make a longer cable run, increasing the wire size of the entire cable to 12 AWG or larger is recommended.

Whether the Control Unit is installed indoors or outdoors, it should be located out of the reach of vandals. Additionally, control and battery enclosures are both supplied with hasps for padlocking securely.

The Control system requires a 120 VAC or 240 VAC 50-60 Hz power source (model dependent).

Several methods can be used to activate the Control Unit. The Manual activation switches can be used to activate the Control Unit locally. Landline control can be used through normally open contact switches. Connections should be made directly to the motherboard terminal block. The control can also be remotely activated via the optional radio receiver or an external 600 ohm audio source.

The total weights of the Control and Battery Box assemblies, including user provided batteries, are listed. Insure that the mounting surface and fasteners can safely sustain the weight of the assembly. Note that each UV400 amplifier must be added to obtain the total weight.

Model No.	Weight
UV	170 lbs.
UV400	4.12 lbs. each

4.1 Siren and Control Location

WARNING

The sound output of the Modulator series speaker arrays is capable of causing permanent hearing damage.

Do not install speaker arrays where persons may come within 150 feet of the direct path of the array.

If speaker array is roof mounted, post warnings at all roof access points.

Many factors affect the propagation of sound over various types of terrain and changing weather conditions. Consult FEMA CPG 1-17 and CPG 1-14 and your local Federal Signal representative to properly place your outdoor warning equipment.

SECTION V
INSTALLATION

WARNING
Electrocution or severe personal injury can occur when making electrical connections, drilling holes, or lifting equipment. Therefore, installation should be performed by experienced electricians in accordance with national and local electrical codes.

WARNING
The output level of a Modulator Series siren is capable of causing permanent hearing damage. To prevent excessive exposure to civilians, carefully plan placement of siren and post warnings. To prevent excessive exposure to installers and service personnel, adequate measures must be taken to ensure that the sirens are not activated while they are within 150 feet of the speaker array or provide proper ear protection.

5.0 Siren Controller Installation

A. General

Most siren installations are one of two types: Pole Mount or Flat Surface Mount. These two (2) configurations make it possible to install a siren in almost any situation. If the installations in this paragraph are not suitable, modification of one of the configurations may be practical.

Many factors affect the propagation of sound over various types of terrain and changing weather conditions. Consult FEMA CPG 1-17 and CPG 1-14 and your local Federal Signal representative to properly place your outdoor warning equipment.

B. Pole Mounting

A typical pole mounted siren installation is shown in the figure below. The siren is mounted on Class 2 utility pole (ANSI type wooden pole or equivalent) with a minimum horizontal ground stress rating of 3,700 pounds (1682 kg). (Insure that soil loads will conform to this size utility pole.)

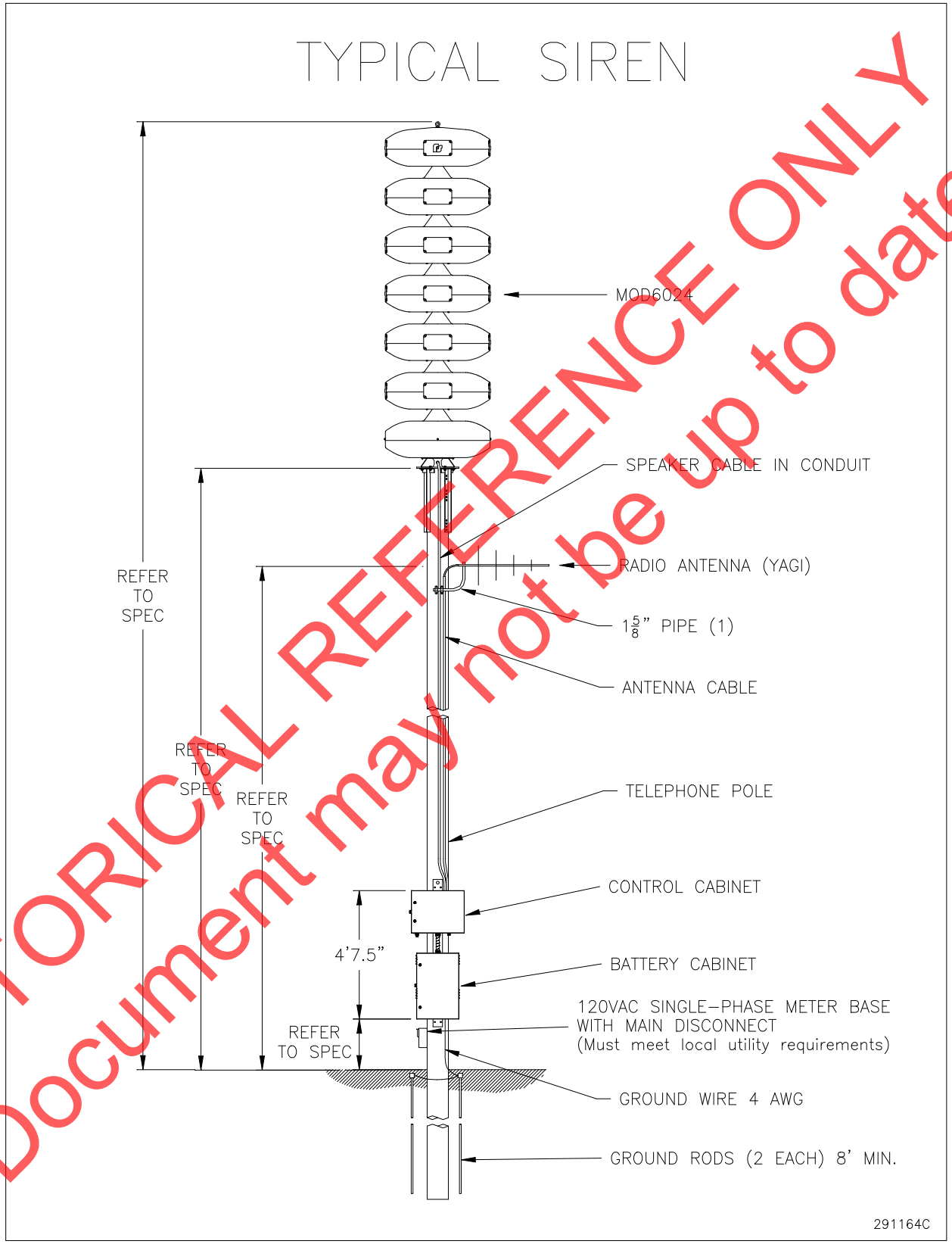
NOTE: Certain soil conditions may require guying for the pole. Check with proper building authorities

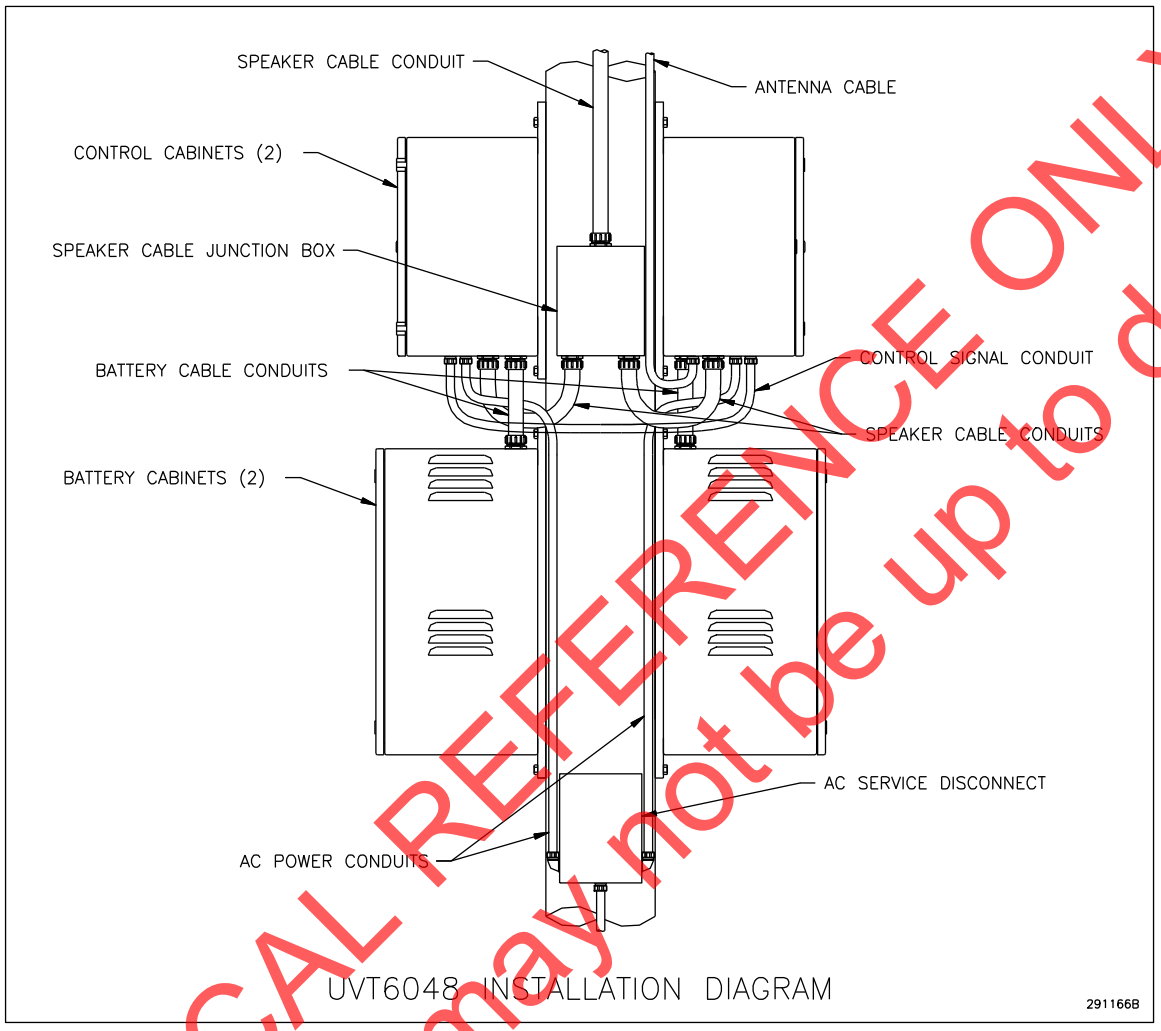
NOTE: The speaker array installation is covered in a separate set of instructions supplied with the array.

To install the ULTRAVOICE control unit to a wooden utility pole, proceed as follows:

1. Uncrate the siren control. Remove the plastic bag attached to the conduit that is connected between the control and the battery box.

2. Unlock the control box and the battery box. Inspect the control and battery box for any damage. Report any damage immediately to the shipping company and file a claim. Inform Federal Signal of the damage.





FEDERAL SIGNAL CORPORATION
FWS SERVICE DEPARTMENT
2645 FEDERAL SIGNAL DRIVE
UNIVERSITY PARK, IL 60466
(800) 524-3021

3. Install the wooden utility pole in accordance with accepted standards and practices.

4. Install the speaker array on the pole following the instructions supplied with the array.

5. Mark the eight (8) mounting holes on the pole for the primary control and battery cabinets. It is recommended that the cabinets be attached to the pole at a height that is accessible to service personnel, but discourages vandalism or as specified per contract. Repeat the process on the other side of the pole for the secondary control and battery cabinets.

6. Drill a 3/8" pilot hole at each of the locations. Drill each hole at least 3-1/2" [90 mm] deep.

7. Use a crane or mechanical hoist to lift the primary control battery box assembly to the desired height along the pole. Attach the primary control battery box assembly to the pole, using four (4) user-supplied 1/2" x 5" lag bolts. Slide a user-supplied 1/2" flat washer onto each bolt before threading the bolt into the pole.

8. Attach the primary control box assembly to the pole, using four (4) user-supplied 1/2" x 5" lag bolts. Slide a user-supplied 1/2" flat washer onto each bolt before threading the bolt into the pole. Repeat the process on the other side of the pole for the secondary cabinets (UV6048 models only).

9. Mount a user-supplied fused disconnect switch on the pole beneath or beside control unit.

See Electrical Connections Section 5.1.

C. Flat Surface Mount

WARNING

It is recommended that notices be posted at all roof access points indicating a roof mounted siren is installed and a potential of hearing damage exists.

It may be practical to mount the siren on a flat-roofed building, depending on the location of the speaker array. When installing the siren on a flat roof, always be sure that the loudspeakers clear parapets or other obstructions by at least ten (10) feet.

Total weight of the ULTRAVOICE control and battery box assembly is listed in specifications section. Make sure that the mounting surface and mounting method selected can safely sustain the weight of the assembly and user provided batteries. In addition, the mounting method used must be able to withstand external mechanical stresses that may be applied to the assembly (such as applicable wind-loads for the area). Consult building authorities in your area for recommendations regarding local ground conditions and wind-loads.

1. Install the speaker array on the roof, following the instructions supplied with the array.

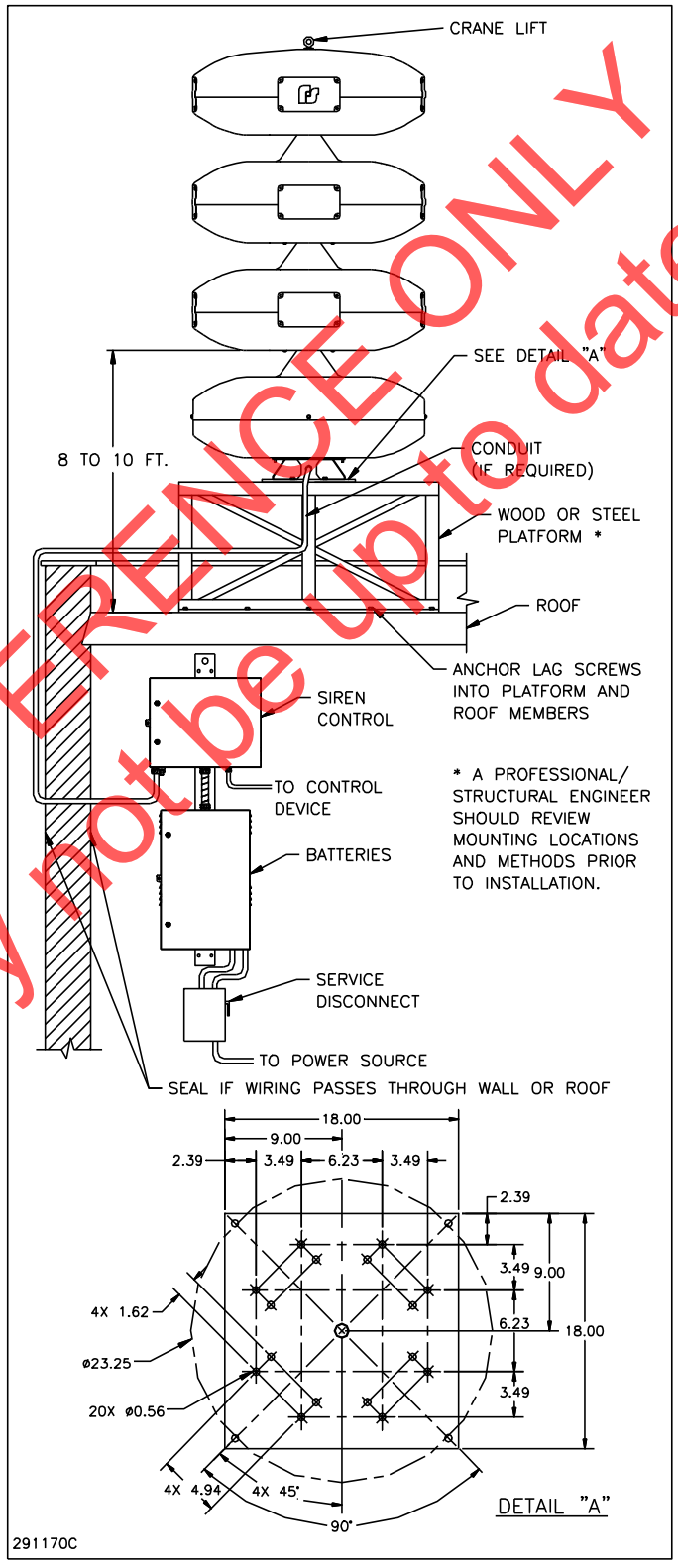
2. Attach the template to the wall and mark the eight (8) mounting holes on the pole for the primary control and battery cabinets. Repeat the process for the secondary control and battery cabinets.

3. Drill a 3/8" pilot hole at each of the locations. Drill each hole at least 3-1/2" (90 mm.) deep.

4. Use a lift to lift the primary control battery box assembly to the desired height along the pole. Attach the primary control battery box assembly to the wall, using four (4) user-supplied 1/2" x 5" lag bolts. Slide a user-supplied 1/2" flat washer onto each bolt before threading the bolt into the pole.

5. Attach the primary control box assembly to the wall, using four (4) user-supplied 1/2" x 5" lag bolts. Slide a user-supplied 1/2" flat washer onto each bolt before threading the bolt into the pole.

Repeat the process for the secondary cabinets (UV6048 models only).



6. Install a user-supplied, fused, disconnect switch. Use the proper type required by the authority having jurisdiction in your area.

7. If the speaker array is installed on the roof of the building, it may be desirable to install the control and battery box inside the building, if practical.

5.1 Electrical Connections

A. General

Install the siren electrical system in compliance with local electrical codes and NEC recommendations.

As a safety precaution to protect personnel and equipment**, ALL SIREN UNITS MUST BE SOLIDLY CONNECTED TO AN EARTH GROUND.** If the siren is installed on a building, ground the system to a metallic object known to be on a dedicated earth ground. For pole mounted installations, drive a metal rod or bar at least eight feet (8 ft.) into the ground, as close as practical to the base of the pole. **FOR MAXIMUM PROTECTION, USE A SEPARATE, CONTINUOUS 6 AWG OR LARGER WIRE FROM THE SIREN FRAME TO GROUND AND FROM THE CABINET OF EACH SIREN UNIT TO GROUND.**

NOTE: CONDUIT CONNECTIONS MUST BE SEALED AND PROTECTED TO PREVENT WATER ENTRY AND CORROSION IN THE CONTROL CABINET.

B. Power Connections

1. Route 1/2" conduit (steel preferred) between the user-supplied, fused disconnect switch and the conduit-fitting hole in the bottom right-hand of the control unit enclosure. Use weatherproof switches, electrical boxes and connectors to **prevent water entry** and corrosion.

2. Route two (2) user-supplied power wires and a ground wire through the conduit that was just installed between the control unit and the fuse disconnect box. Use wires no smaller than 14 AWG. Connect the ground wire to the green and yellow DIN mounted terminal block or the cabinet ground stud. Verify the appropriate siren model has been purchased. 240VAC models contain a step-down transformer pre-wired to the DIN rail located on the right side of the control cabinet. Connect the two AC power wires to the DIN mounted terminal blocks labeled L1 and L2.

Connect the power wires and the lightning protector to the AC disconnect box per instructions provided with the lightning protector and governing electrical codes.

C. Signal Connections

Refer to the tables below for speaker wire connections. Module locations are 0 at the bottom, 1 next up etc.

If the ULTRAVOICE is going to replace an existing controller, prior to the UV controller, re-wire the siren as shown in **APPENDIX A** before making the speaker connections. **IMPROPER INSTALLATION CAN DAMAGE THE DRIVERS.**

Table 1 - Modulator Speaker Wiring (MOD1004 – MOD6024)

Terminal Number	Wire Color	Module Location	Siren Model
JP21-1	White/Brown	1	1004,2008,3012,4016,5020,6024
JP21-2	Brown	1	1004,2008,3012,4016,5020,6024
JP22-1	White/Red	2	2008,3012,4016,5020,6024
JP22-2	Red	2	2008,3012,4016,5020,6024
JP23-1	White/Orange	3	3012,4016,5020,6024
JP23-2	Orange	3	3012,4016,5020,6024
JP24-1	White/Yellow	4	4016,5020,6024
JP24-2	Yellow	4	4016,5020,6024
JP25-1	White/Green	5	5020,6024
JP25-2	Green	5	5020,6024
JP26-1	White/Blue	6	6024
JP26-2	Blue	6	6024

Note: See appendix A for drawing examples.

Table 2 - MOD6048 Speaker Wiring

Mount a user supplied junction box between the two (2) control cabinets. Run 1" flexible conduit from the junction box to the primary and secondary control cabinet's 1" conduit hole on the bottom of the top cabinet. Wire the speaker cable into the control box as shown in tables below.

Terminal Number	Wire Color	MOD6048 Module Location
JP21-1	White/Brown	1
JP21-2	Brown	1
JP22-1	White/Red	1
JP22-2	Red	1
JP23-1	White/Orange	2
JP23-2	Orange	2
JP24-1	White/Yellow	2
JP24-2	Yellow	2
JP25-1	White/Green	3
JP25-2	Green	3
JP26-1	White/Blue	3
JP26-2	Blue	3

Secondary Control Speaker Wiring 6048

Terminal Number	Wire Color	MOD6048 Module Location
JP21-1	White/Violet	4
JP21-2	Violet	4
JP22-1	White/Grey	4
JP22-2	Grey	4
JP23-1	Black/White	5
JP23-2	White	5
JP24-1	White/Tan	5
JP24-2	Tan	5
JP25-1	White/Black	6
JP25-2	Black	6
JP26-1	White/Pink	6
JP26-2	Pink	6

Note: See appendix A for drawing examples.

Table 3 - EOWS-612 Speaker Wiring

Terminal Number	Wire Color	Speaker CKT
JP21-1	White/Black	A,B,C,D
JP21-2	Black	A,B,C,D
JP22-1	White/Brown	E,F,G,H
JP22-2	Brown	E,F,G,H
JP23-1	Red	I,J,K,L
JP23-2	Orange	I,J,K,L
JP17-5	Orange/Yellow	Dir. Sensor West
JP17-3	Orange/Green	Dir. Sensor South
JP17-4	Orange/Red	Dir. Sensor East
JP17-2	Orange/Blue	Dir. Sensor North
JP17-1	Orange/Black	Dir. Sensor Common
GND Stud	White/Orange	GND
JP11-1	White/Red	+24 VDC

Note: See appendix A for drawing examples.

Refer to the EOWS-612 Siren manual for further wiring information

Speaker Wiring for DSA Series Sirens

DSA speaker arrays range in size from 200 watts to 600 watts. The ULTRAVOICE controller may drive multiple combinations of DSA speakers up to 3200 watts of power. Each ULTRAVOICE amplifier is designed to drive an 11 ohm impedance which corresponds to two series pairs of DSA speakers wired in parallel (400 watts).

Because virtually any combination of DSA arrays may be used with an ULTRAVOICE controller, all possible wiring diagrams are not shown in this manual. See appendix A for drawing examples.

The controller's 400 watt amplifier outputs are labeled JP21 through JP28. Position 2 (two) on these outputs connects to the solid colored wires from the DSA array. Position 1 (one) connects to the corresponding striped wire from the DSA array.

DSA arrays must be purchased in 400 watt power combinations. The use of 300 or 500 watt (DSA3 and DSA5) require two or more arrays i.e.: 4 x 300 watt = 1200 watts.

Table 4 - Wiring example for four DSA6 speaker arrays

Terminal No.	Wire Color	Drivers	Array
JP21-1	White/Brown	A,B,C,D	DSA6 #1
JP21-2	Brown	A,B,C,D	DSA6 #1
JP22-1	White/Brown	A,B,C,D	DSA6 #2
JP22-2	Brown	A,B,C,D	DSA6 #2
JP23-1	White/Brown	A,B,C,D	DSA6 #3
JP23-2	Brown	A,B,C,D	DSA6 #3
JP24-1	White/Brown	A,B,C,D	DSA6 #4
JP24-2	Brown	A,B,C,D	DSA6 #4
JP25-1	White/Red	E,F	DSA6 #1&2
JP25-2	Red	E,F	DSA6 #1&2
JP26-1	White/Red	E,F	DSA6 #3&4
JP26-2	Red	E,F	DSA6 #3&4

Note:

1. After the connections to JP21 – JP24 are made, the Red wires from the first two DSA arrays must be tied together and jumpered to JP25-2. Likewise, the White/Red wires from the first two DSA arrays must be tied together and jumpered to JP25-1. Repeat this procedure for the second two DSA arrays and connect to JP26.

Note: See appendix A for drawing examples.

Table 5 - Wiring example for four DSA3 speaker arrays

Terminal Number	Wire Color	Drivers	Array
JP21-1	White/Brown	A,B	DSA3 #1&2
JP21-2	Brown	A,B	DSA3 #1&2
JP22-1	White/Brown	A,B	DSA3 #3&4
JP22-2	Brown	A,B	DSA3 #3&4
JP23-1	White/Red	C	DSA3 #1&2&3&4
JP23-2	Red	C	DSA3 #1&2&3&4

Notes:

1. The Brown wires from the first two DSA arrays must be tied together and connected to JP25-2. Likewise, the White/Brown wires from the first two DSA arrays must be tied together and connected to JP25-1. Repeat this procedure for the second two DSA arrays and connect to JP26.

2.
   a. Connect the White/Red wire from DSA3 #1 to the Red wire from DSA3 #2.
   b. Connect the White/Red wire from DSA3 #3 to the Red wire from DSA3 #4.
   c. Connect the Red wires from DSA3 #1 and #3 together and jumper to JP23-2.
   d. Connect the White/Red wires from DSA3 #2 and #4 together and jumper to JP23-1.

Note: See appendix A for drawing examples.

D. UVT6048 Inter-Cabinet Wiring

1. Route 1” flexible conduit between the two (2) top cabinets.

2. Route the supplied 22 AWG white wire attached to the charger (-) output in the secondary control through the conduit and butt splice or wire nut to the 22 AWG white wire attached to the charger (+) output in the primary control cabinet.

3. Route both 22 AWG orange wires in the secondary control cabinet through the conduit to the primary control cabinet. Wire one orange wire from the secondary cabinet to JP15 position 4. Connect the other orange wire from the secondary cabinet to the orange wire coming from the intrusion switch in the primary battery cabinet with a butt splice or wire nut.

4. Route the supplied six (6) conductor cable through the conduit and attach one end to JP18 of the primary control cabinet and the other to JP29 on the secondary control cabinet.

5. Route the supplied 4 AWG black wire through the conduit and land on the (-) stud of both motherboards. Make sure the nuts are on tight taking care not to damage the motherboard.

E. Battery Hookup

DANGER
When installing or removing batteries, take care to avoid shorting battery terminals to the metal battery cabinet. Failure to do so could result in serious personal injury or death. Batteries mis-wired can cause serious personal injury or death. Read and understand the following information before making actual connections.

The end user must obtain batteries to install in the lower cabinet(s) as listed in the specifications section of this manual.

Wire batteries as follows:

1. Remove the accessory kit from the battery box.

2. Connect the wires as shown in the appropriate system wiring diagram for the model of UltraVoice purchased; 259024 (2-way models), 259025 (1-way models), or 259027(UVT6048) as appropriate.

3. Apply silicon grease to battery terminals after wiring to prevent corrosion.

F. Optional Connections

Refer to Section 8 for optional equipment connections and setup.

See wiring diagram appendix B for field wiring of the 6048 models.

5.2 Other Connection Options

Note: See specifications and table below, in addition to the listed resources.

600 ohm - See Sections 3 & 7.
Radio - See Sections 7 & 8.
Remote landline activation - See Sections 3 & 7

5.3 Control Unit Connector Configuration

Refer to Tables below for description of connectors in control assembly.

CONNECTOR DESIGNATION	PURPOSE
Connectors for 2005141 Controller PCB	
JP1	On-Board Receiver Module Connector Pins: 1 Ground 2 +8 V 3 Clock 4 Data 5 Latch Enable 6 Carrier Detect Not 7 De-Emphasized Receive Audio 8 Not Used
JP2	Inter-Board Connections Between controller and motherboard See controller schematic for details
JP3	SINAD Pins: 1 Ground 2 SINAD
JP4	Charger Sense: -Jumper out: Used on battery charger Pass on >3 VDC@JP20-2 -Jumper in: Used on solar Pass on 1 VDC less than battery Voltage@JP20-2 Pins: 1 Charger selection 2 Charger selection

JP5	Carrier detect Jumper in- Force Carrier Detect 1 Carrier Detect 2 Ground
JP6	External Radio Connector Pins: 1 RX Audio in 2 TX Audio out 3 Carrier Detect 4 PTT 5,7 12 VDC for Radio 6,8 Ground
JP7	CTCSS Connector Pins: 1 RX Audio in 2 Ground 3 8 VDC for CTCSS board 4 Audio Switch 5 TX CTCSS tone
JP8	600-Ohm Configuration Jumper -See motherboard JP15 and JP12 Pins: Jumpered is active 2-3 Activation audio from JP12 1-2 PA mode - External audio source at JP12 - Level adjusted by R111
JP9	Receiver Priority Pins: 1-3 External Receiver Priority 2-4 Internal Receiver Priority
JP10	Digital Disable Jumper Pins 1-2 to disable Digital Decoder
JP11	SINAD Jumper Pins 1-2 to enable SINAD Board Note: JP9 Must have both 1-3 & 2-4 jumpered when SINAD is used

JP13	600 Ohm Output 1-2 Output siren audio. 2-3 Output radio transmitter audio
JP14	Jumper to enable VOX carrier detect for external transceiver
J1	Microphone Jack - see specifications Tip Audio in Ring PTT Sleeve Ground
P1	6 Pin Standard Serial Port Pins: 1 Digital Receive / Serial Port Not -Serial Port mode-grounded -Digital receive mode-no ground 2 TX Data 3 RX Data 4 Ground 5 Clock for programming CPU 6 CPU Reset - Ground resets CPU

CONNECTOR DESIGNATION	PURPOSE
Connectors for 2005147 Motherboard	
JP1	ULTRAVOICE Controller Interconnect
JP2	Expansion Port
JP3	Amplifier 1 Interconnect
JP4	Amplifier 2 Interconnect
JP5	Amplifier 3 Interconnect
JP6	Amplifier 4 Interconnect
JP7	Amplifier 5 Interconnect
JP8	Amplifier 6 Interconnect
JP9	Amplifier 7 Interconnect
JP10	Amplifier 8 Interconnect
JP11	Rotator Relay Pins: 1&2 Normally Open Contact -Relay is fused at 20 amps
JP12	600-Ohm Audio Pins: 1&2 Transformer Balanced Audio -See specifications for levels -See controller JP8 jumper - Requires PTT @ JP15-10
JP13	24 V Power Output Pins: 1 Ground 2 24 VDC -Fused at 10 amps
JP14	Remote Activation InputPins: 1,10 ISO Ground 2 Function 1 3 Function 2 4 Function 3 5 Function 4 6 Function 5 7 Function 6 8 Function 7

JP15 — Sensor Inputs

Pins:

1,3,5,7,9,11	ISO Ground
2	Spare #1
4	Intrusion
6	Solar
8	AC Power
10	600 ohm PTT
12	Spare #2

JP16 — Isolated Power Supply

Pins:

1	5 VDC (-)
2	5 VDC (+)

- 150 mA maximum current
For external equipment

JP17 — Rotation Sensor Input

Pins:

1	ISO Ground
2	North - active low
3	South - active low
4	East - active low
5	West - active low

JP18 — Expansion Port, Primary Cabinet

Pins:

1	Ground
2	I2C VCC 5 VDC
3	Serial Clock 2
4	Serial Data 2
5	Amplifier Audio Signal 1
6	Amplifier Audio Signal 2

JP19 — Test Speaker (listen to receive audio)

Pins:

1	Receive audio (same as TP6)
2	Ground

JP20 — Charger Sensor Input

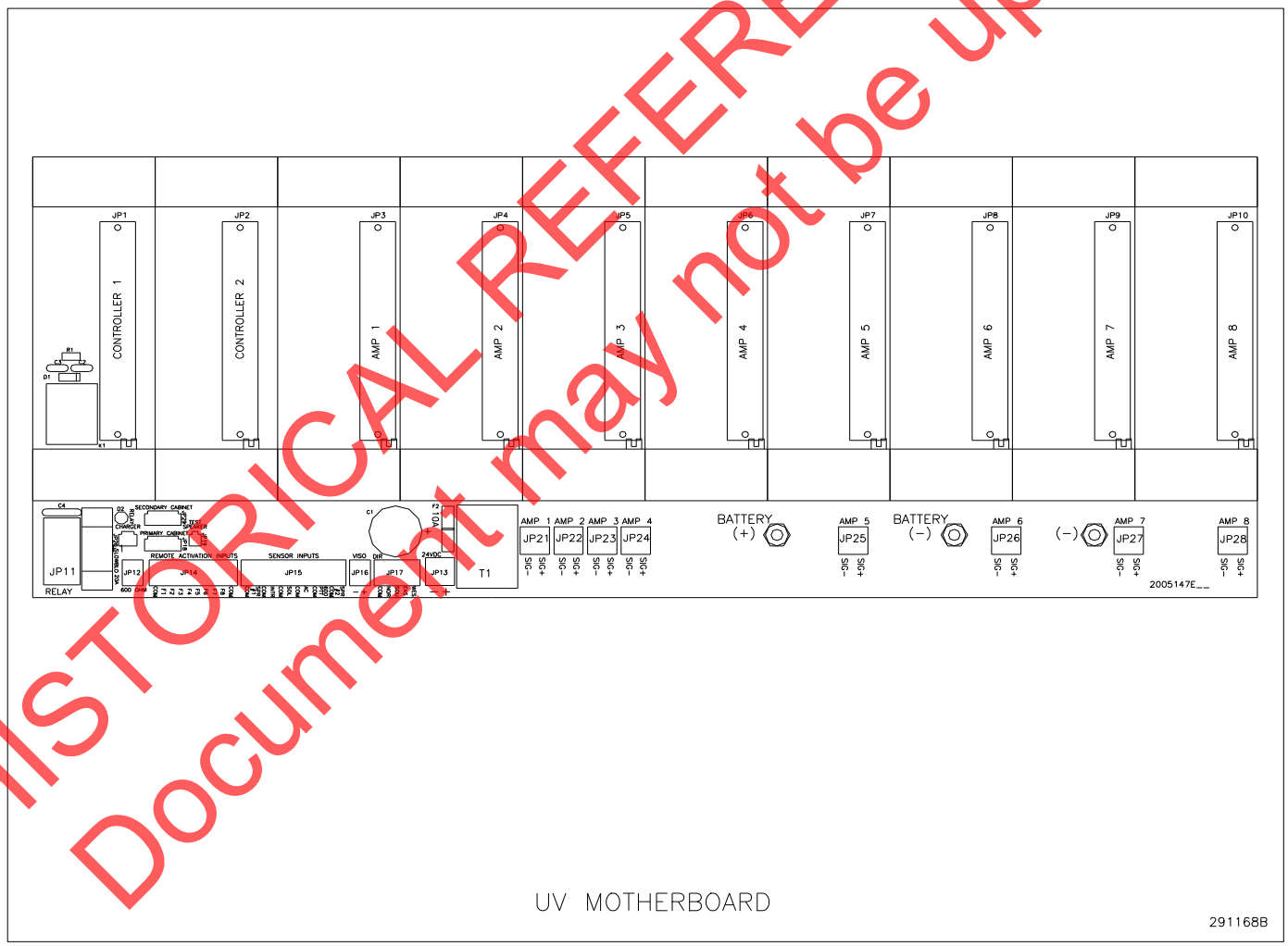
Pins:

1,3	Ground
2	Input from charger

-See JP4 on controller board

JP21	Amplifier 1 Output Pins: 1 SIG - 2 SIG +
JP22	Amplifier 2 Output Pins: 1 SIG - 2 SIG +
JP23	Amplifier 3 Output Pins: 1 SIG - 2 SIG +
JP24	Amplifier 4 Output Pins: 1 SIG - 2 SIG +
JP25	Amplifier 5 Output Pins: 1 SIG - 2 SIG +
JP26	Amplifier 6 Output Pins: 1 SIG - 2 SIG +
JP27	Amplifier 7 Output Pins: 1 SIG - 2 SIG +

JP28	Amplifier 8 Output Pins: 1 SIG - 2 SIG +
P29	Expansion Port, Secondary Cabinet Pins: 1 Ground 2 I2C VCC 5VDC 3 Serial Clock 1 4 Serial Data 1 5 Amplifier Audio Signal 1 6 Amplifier Audio Signal 2



5.4 Yagi Antenna Installation

Yagi Antenna Pre-Assembly

1. Unpack the antenna and locate the following parts:
   - Boom (1-14" for 5 element model, 7/8" diameter for 3 element model)
   - 3/8 diameter elements
   - (y---3 = 3 elements, y----5 = 5 elements)
   - Gamma match parts bag
   - Mounting bracket parts bag

2. Find the proper element dimension chart for your antenna, within the antenna instructions, and trim each element according to your operating frequency. Use care to trim equal lengths from each end of each element ensuring that the mounting hole is at the center.

Note A: Proper trimming and adjustment is critical to the voltage standing wave ratio, known as VSWR. (Basic understanding, in laymen's terms, for VSWR- reflected power is bad and decreases forward power). (The life of the radio and transmit capabilities is dependent upon the VSWR being low as possible).

Note B: If two frequencies are being used, then trim the antenna to the transmit frequency of the unit where the antenna will be mounted.

3. Insert the elements into their respective locations through the boom, starting with R1 (the reflective element) in the hole closest to the mounting holes. Then insert Dr, D1 etc. in that order.
   Note A: Shortest element is furthest away from the mount and increases in size as it gets closer to the mount.
   Note B: Be very careful to line up the holes and not cross thread when securing the elements in the next step. The bolts must tighten all the way down upon the lock washers.

4. Secure the elements with the stainless steel 10-32 hex bolts and #10 lockwashers provided.

5. Locate the connector/brass tube assembly in the gamma match parts bag and insert the assembly first through the connector bracket, then thread the connector into the bracket. Be sure to tighten the connector fully. A drop of Locktite or other threadlock may be used in the threads to eliminate the possibility of the connector loosening.

6. Slide the gamma link onto the driven element and assemble the gamma match as shown in figure 1 or 2. Set dimensions "A" and "B" to those shown in table 1. Setting the match to the dimensions shown for your antenna is a good starting point that will allow you to quickly line tune later. Complete the assembly by attaching the end cap onto the end of the gamma tube. The antenna is now ready for final tuning.

5.5 Final VSWR Tuning

1. Before final installation of the antenna, temporarily set it up in a clear area at least six feet above the ground.

Note A: Do not touch the antenna while the radio is transmitting.
Note B: Ensure antenna is not touching any conductive material and is pointed

away from all objects and people. Pointing antenna at objects in close proximity may act as a reflector and create inaccurate readings.

2. Apply RF power to the antenna at the transmit frequency to be used at that antenna, and check for the low VSWR while performing each of the following steps.

A. First, loosen the set screw with the Allen key provided and make a slight adjustment to the aluminum gamma tube for the lowest VSWR (Reflected power).
B. Next adjust the gamma link along the driven element for the lowest VSWR.
C. Repeat the above steps until the lowest VSWR is achieved. Reflected power must be less than 10% of the forward power.
D. Return to the dimensions shown in Table 1 if there is any trouble achieving a good match. If the element dimensions are incorrect for the frequency being used, low VSWR may be unattainable. If the VSWR specification is still unattainable, replace the cable (a simple ohm meter check of the cable does not guarantee that the antenna cable is good, due to the DMM not having the ability to check the cable at high frequencies). If that does not take care of the problem, replace the antenna.

5.6 Mount Yagi Antenna

****NOTE****
SEE FIGURE BELOW FOR MOUNTING ANTENNA

1. Install antenna, (using installation bracket or equivalent) as high as possible in which the antenna cable and obstacles will allow, and install on side of pole closest to the receiving station. Aim antenna at receiving station.

Note A: Objects around the antenna will affect the antenna, keep antenna pointed away from objects.

2. Ensure antenna cable connections are tight. Seal all connection points with heatshrink or tape and seal with Scotch Coat, or equivalent.

3. Apply RF power to the antenna at the transmit frequency to be used at that antenna, and check the VSWR (Reflected power). Reflected power must be less than 10% of the forward power.

4. If the VSWR specification is unattainable, replace the cable (a simple ohm meter check of the cable does not guarantee that the antenna cable is good, due to the DMM not having the ability to check the cable at high frequencies). If that does not take care of the problem, replace the antenna.

5.7 Omni Antenna Installation

Fiberglass, no tune models

****NOTE****
SEE FIGURE 6-10 FOR MOUNTING ANTENNA

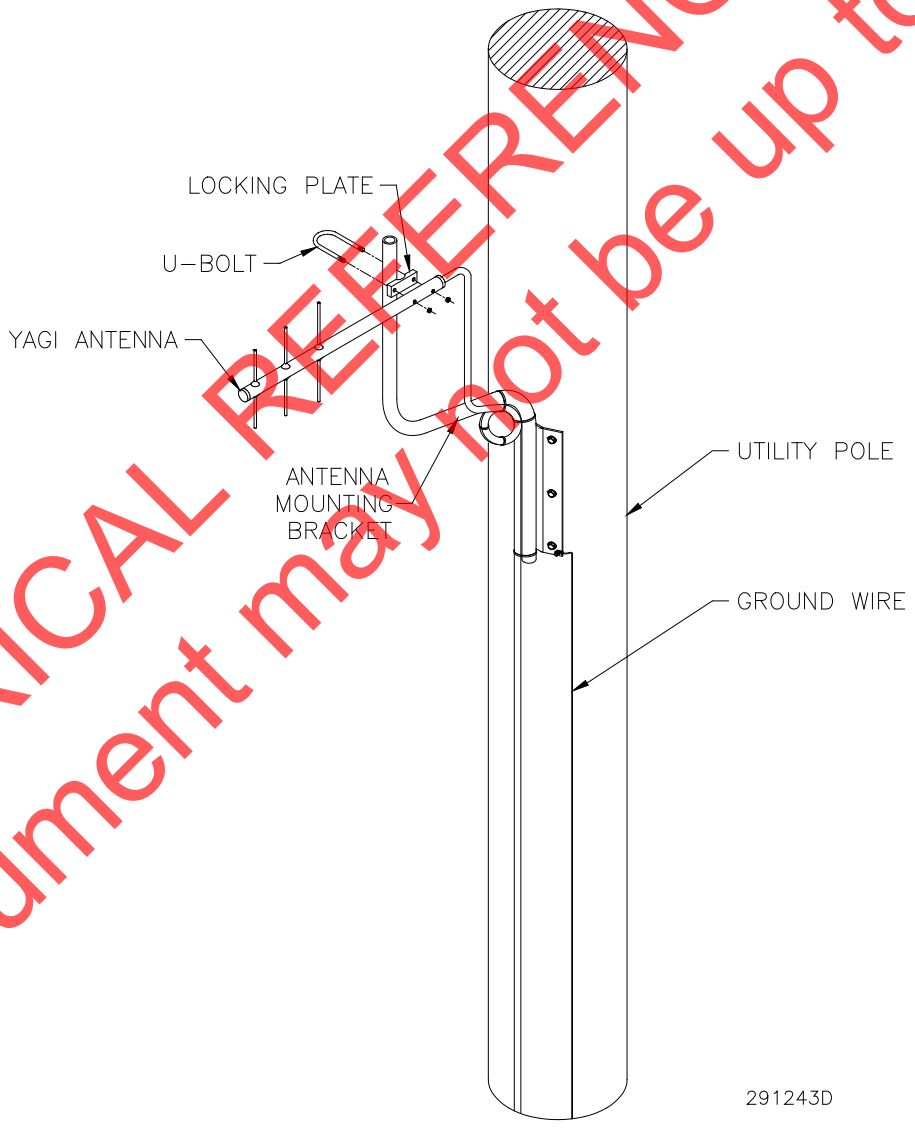
1. Install antenna, (using installation bracket or equivalent) as high as possible in which the antenna cable and obstacles will allow, and install on side of pole closest to the receiving station.

Note A: Objects around the antenna will affect the antenna, keep antenna away from objects.

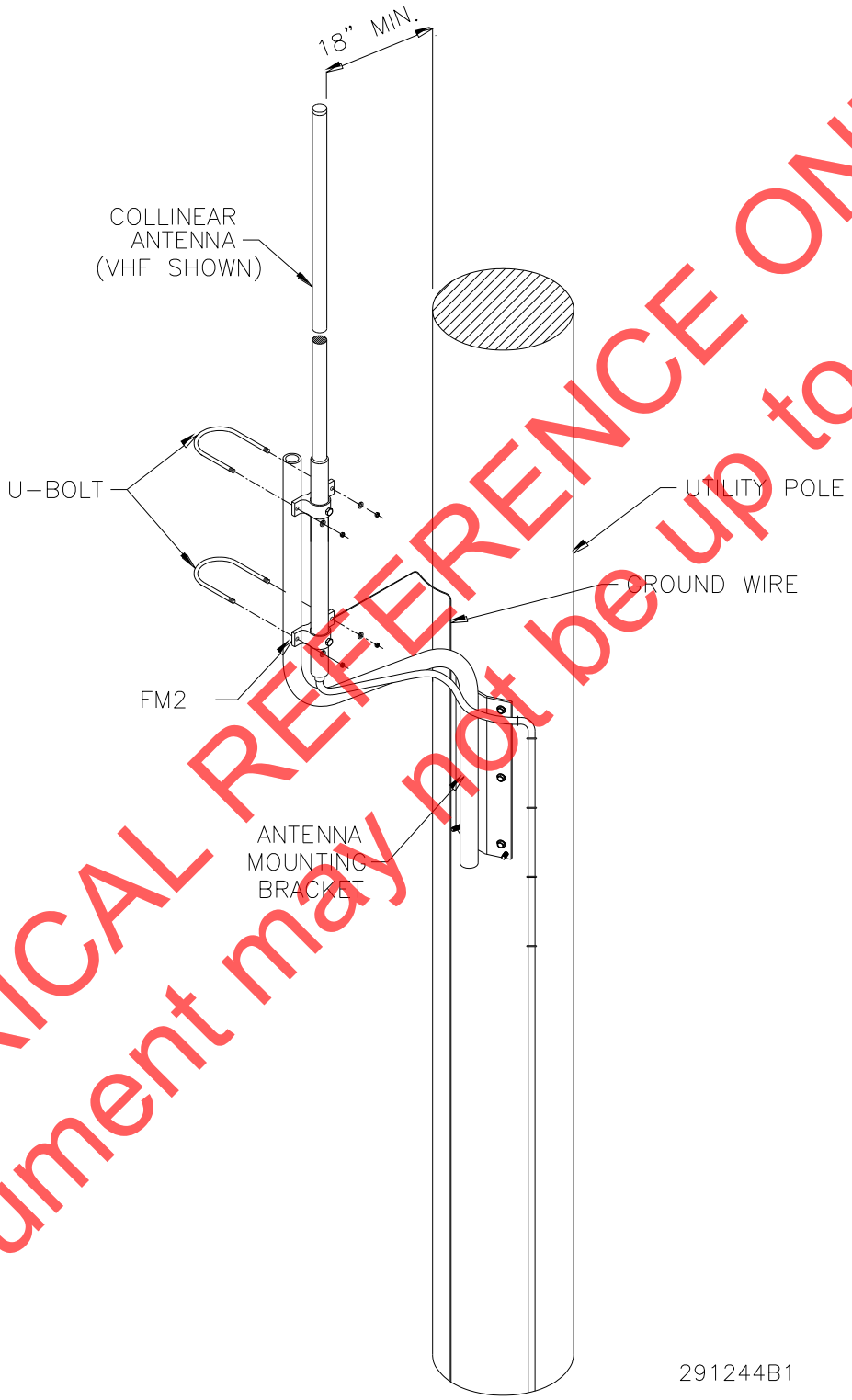
2. Ensure antenna cable connections are tight. Seal all connection points with heatshrink or tape and seal with Scotch Coat, or equivalent.

3. Apply RF power to the antenna at the transmit frequency to be used at that antenna, and check the VSWR (Reflected power). Reflected power must be less than 10% of the forward power.

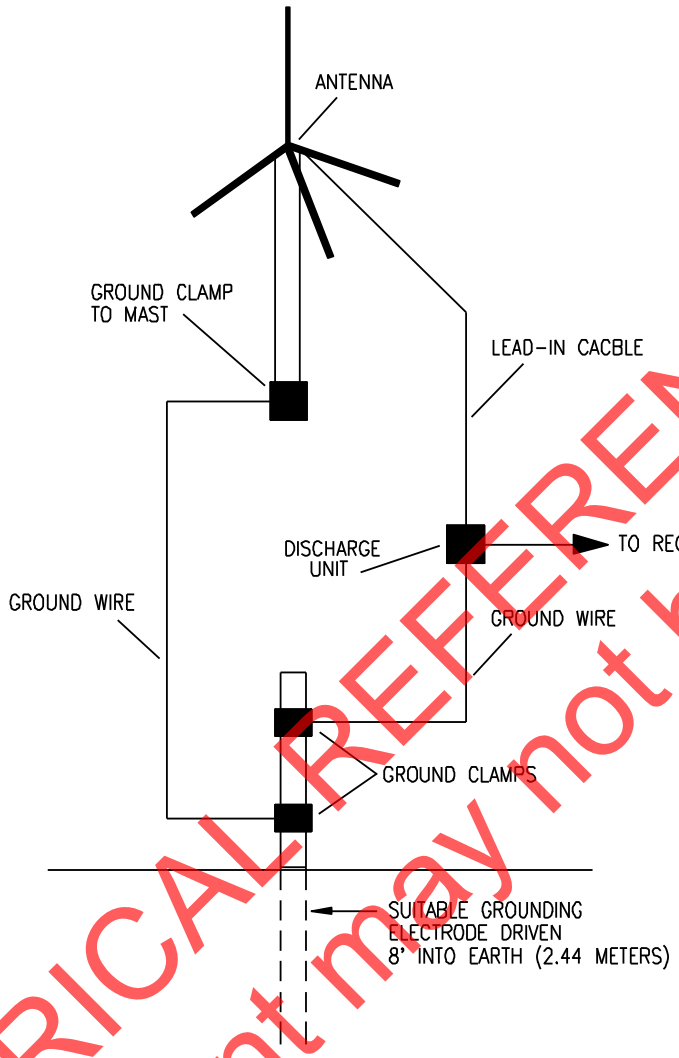
If the VSWR specification is unattainable, replace the cable (a simple ohm meter check of the cable does not guarantee that the antenna cable is good, due to the DMM not having the ability to check the cable at high frequencies). If that does not take care of the problem, replace the antenna.



Yagi Antenna Installation Example



EXAMPLE OF ANTENNA GROUNDING AS PER NATIONAL ELECTRICAL CODE INSTRUCTIONS (REFER TO N.E.C. FOR COMPLETE INSTRUCTIONS.)



A. USE NO. 10 AWG COPPER, NO. 8 AWG ALUMINUM, NO. 17 AWG COPPER CLAD STEEL OR BRONZE WIRE, OR LARGER AS GROUND WIRE FOR BOTH MAST AND LEAD-IN.

B. SECURE LEAD-IN CABLE FROM ANTENNA TO ANTENNA DISCHARGE UNIT AND MAST GROUND WIRES TO HOUSE WITH STAND-OFF INSULATORS, SPACED FROM 4 FEET (1.22 METERS) TO 6 FEET (1.83 METERS) APART.

C. MOUNT ANTENNA DISCHARGE UNITS AS CLOSE TO WHERE LEAD-IN CABLE ENTERS HOUSE AS POSSIBLE.

291160

Antenna Grounding

SECTION VI
PRE-OPERATION CHECKOUT AND TEST

Note: See UV RTU Field Service Data Sheet located at the end of this section. This is the suggested data sheet that can be used to test the siren.

6.0 Amplifier and Speaker Pre-Operation Checkout

With an ohmmeter capable of accurately measuring resistance of less than 10 ohms, hold the meter probes on the speaker terminal strips at the bottom of the system motherboard for each amplifier and measure the resistance at the output of that amplifier. The resistance should be approximately 4.5 ohms. A different reading indicates a possible wiring error or faulty driver in the speaker array. Since the 400 watt speaker circuits are comprised of two sets of series wired speaker drivers connected in parallel, if one of the drivers in a circuit were to open, approximately 9 ohms would be measured. If 200 watt DSA speaker combinations are used, a 10.8 ohm reading should be measured across the 200 watt load.

WARNING

The output sound level of a Modulator Siren is capable of causing permanent hearing damage at short distances; sound levels may exceed 150 dB. Therefore, ALWAYS wear adequate hearing protection when performing tests or maintenance on the siren.

Power should be supplied to the siren so that the batteries may be charged for a period of 24 hours prior to operation of the siren in order to ensure full charge of the batteries. (Alternatively, the batteries may be charged externally before installation following battery the battery manufacturer's recommendations.) Typical battery voltage should be 27.2 VDC when fully charged at room temperature. (See specification section for details.)

After the batteries have been charged, a simple and non-annoying test for siren operation would be to disconnect all amplifier terminal strip connectors from the bottom of the system mother board, press one of the manual activation switches to start one of the pre-programmed functions. The signal A & B LEDs should light on the control, indicating that the tone is being generated from the control module and the amplifier power and output LEDs should be lit. Now momentarily insert the terminal strip connectors sequentially for each amplifier. You will hear the siren tone from the speaker array for the duration of the time that the connector is installed (amplifier output points on the connector should read 67 VAC RMS nominally, this level will read higher when the speakers are removed). Cancel the signal tone or wait for it to time out (typically 3 minutes). If you wish, you may insert all of the terminal strip connectors and activate any or all signals for full volume siren testing.

6.1 Initial Checkout

The siren is now ready to operate as a stand-alone device with control from the front panel. If you wish to remotely control this siren via landline, you will find terminal blocks located at the bottom of the system motherboard labeled REMOTE ACTIVATION INPUTS (JP14). A momentary, dry contact closure between COM and any other JP14 terminal will activate the associated function (see Section 5.3).

The SIG OUTPUT LED indicates that the amplifier output signal level is sufficient for siren signal operation.

FINAL TESTS

Note: Refer to the factory data sheet and unit programming data sheet, which should have been shipped with the controller.

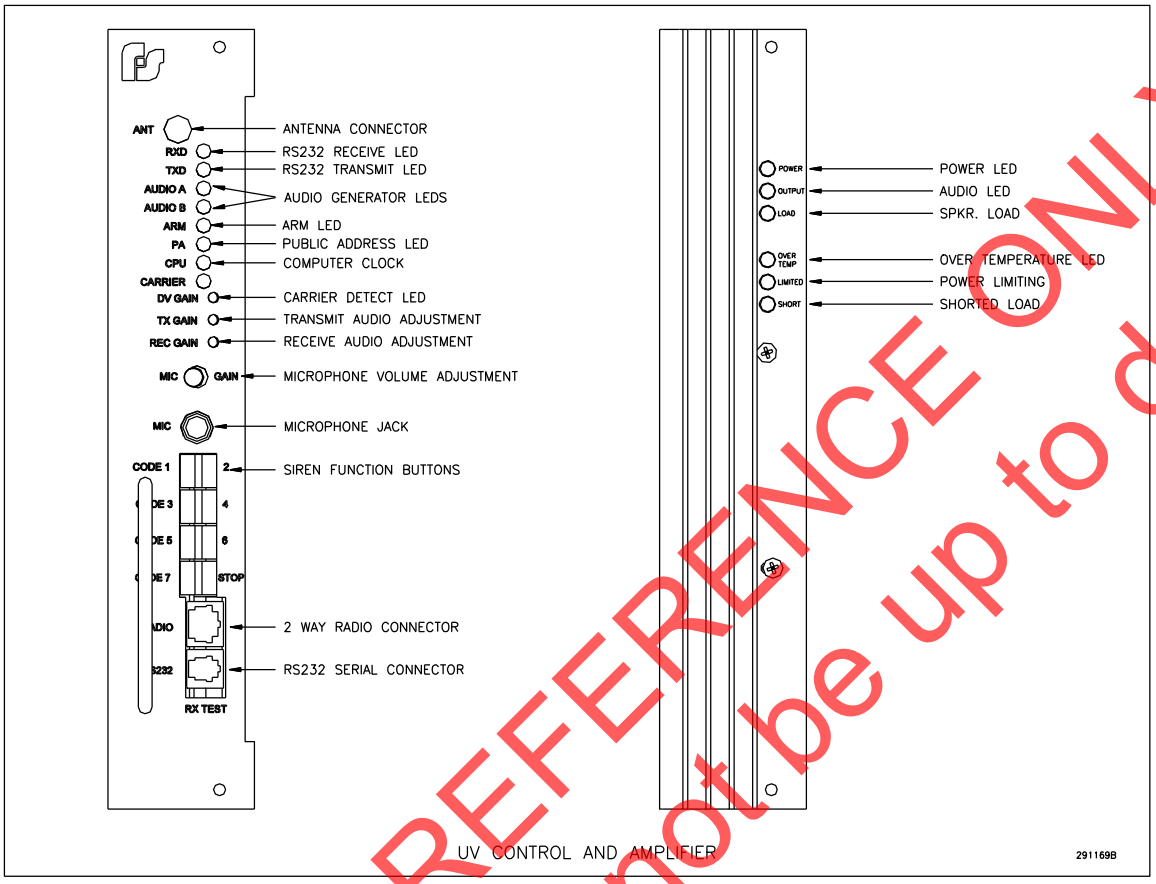
If the controller is using two-way communication, calibrate the Quiet Test function by pressing switches 2 & 3 on the front panel at the same time.

All siren signals should be tested at this time by momentarily depressing the appropriate switch on the control module front panel, or if possible by radio activation. If included, the optional radio interface should be tested at this time. See Options Section concerning radio information. Test and verify proper operation of all functions over the radio system. If two way radio communication, then check the Central Control Unit base station reports for failures.

After the installation is complete and it has been established that the siren is operating properly, Federal recommends that the Control Unit and battery box be padlocked to discourage vandalism.

A factory test data sheet and unit programming data sheet should have been shipped with the controller. Suggest that these data sheets be kept on record by the customer for future reference.

Note: See UV RTU Field Service Data Sheet located at the end of this section. This is the suggested data sheet that can be used to test the siren.



UV RTU Field Report		
Customer:	Project Number:	Date:
Contact Person:	Phone:	Second Phone:
Radio Shop:	Contact:	Phone:

Siren Type:	S/N:	Voltage:
Controller Type:	Antenna: Omni ☐ Yagi ☐	A/C Service: O.H. ☐ U.G. ☐
CPU Software:	Program file:	SMV:

Radio Information: Low Band ☐ VHF ☐ UHF ☐ 800 ☐ Trunk ☐ 12.5 kHz ☐ 25 kHz ☐
Radio Frequency: TX RX PL

Site:	S/N:	Address:	Zone:
A/C voltage: V AC	Battery voltage:	Charger voltage:	

Battery Type:	Model:	Manufacturer:

Press buttons “2” & “3” on the CPU control board simultaneously. This will calibrate the speakers and amplifiers.

Remove audio output lines from Amps 1-8 on the motherboard by pulling down on them. This will remove the speakers from the circuit.

Select and execute the “ STEADY “ signal. Take RMS readings while unit is performing this function. When done recording readings cancel “STEADY” signal.
Replace audio line to their appropriate location. Record impedance of each speaker driver.

RMS VAC		Impedance Ω		Sensor	State	
Amp 1	**VAC**	Amp 1	Ω	Intrusion Sensor	Pass ☐	Fail ☐
Amp 2	**VAC**	Amp 2	Ω	Low Battery	Pass ☐	Fail ☐
Amp 3	**VAC**	Amp 3	Ω	AC Power On	Pass ☐	Fail ☐
Amp 4	**VAC**	Amp 4	Ω	AC Power Off	Pass ☐	Fail ☐
Amp 5	**VAC**	Amp 5	Ω			
Amp 6	**VAC**	Amp 6	Ω			
Amp 7	**VAC**	Amp 7	Ω			
Amp 8	**VAC**	Amp 8	Ω			

Descant in Control Cabinet: Yes ☐ No ☐	**Debris in Control Cabinet**: Yes ☐ No ☐
Antenna connectors sealed: Yes ☐ No ☐	
Tested by:	Date:

Notes:

SECTION VII
MAINTENANCE

7.0 General

WARNING

Service or maintenance should be performed by qualified personnel familiar with the siren, associated controls, and power sources being used and in conjunction with the authorities having jurisdiction.

The sound output of the siren is capable of causing permanent hearing damage. Use adequate hearing protection and avoid excessive exposure.

Before servicing or maintaining, ensure that remote activation cannot occur and disconnect power to the siren and its controls.

WARNING

The sound output of sirens is capable of causing permanent hearing damage at short distances. Therefore, ALWAYS wear hearing protection when performing tests or maintenance on the siren.

To prevent the siren from sounding, always turn off the power to the siren at the AC disconnect switch and remove any DC power being supplied by the Battery Box before inspecting or maintaining the siren.

The UltraVoice series siren controller is designed to require a minimum amount of maintenance. In addition, experience has shown that all Federal sirens are highly reliable devices. However, if a siren failure does occur, Federal will provide technical assistance with problems that cannot be handled satisfactorily and promptly locally. If assistance is desired, contact:

FWS Service Department
Signal Division
Federal Signal Corporation
2645 Federal Signal Drive
University Park, Illinois 60466
(800) 524-3021

7.1 Control Unit Preventive Maintenance

Test the siren for proper operation at least once a month. A daily test at noon, curfew, or other selected time is preferred. This not only enhances the usefulness of the siren and verifies that it remains ready for use in an emergency, but instills public confidence in the reliability of the warning system.

In order to minimize the possibility siren failure, annual inspection and maintenance is recommended. Additionally see “pre operation checkout and test” section.

7.2 General Maintenance

A. Driver Replacement/Inspection

Each amplifier drives four 100-Watt speakers.
To measure the resistance of a given speaker set, proceed as follows:

1. Set an ohmmeter to its low resistance range, and hold the ohmmeter probes to the outputs on the terminal strip (JP21-28) (at the bottom of the system mother board).

2. Observe the DC resistance of the speakers. Normal DC resistance of a speaker set of 4 drivers is approximately 4.5 ohms. A DC resistance measurement of less than 3.5 ohms indicates that one or both of the speakers is probably shorted. A reading of approximately 9 ohms or more indicates that at least one of the speakers in the set is open; a reading of infinity indicates that both speaker sets are open.

3. If a resistance is abnormal, perform resistance checks on each speaker individually at the speaker array. Refer to the signal connections section for speaker locations. Each individual driver is 4.5 ohms.

4. To replace a defective driver, remove the four (4) hex head 1/4-inch mounting bolts that are holding the inspection plate. Make sure the flat washers and split washers are not misplaced. Note the color and location of the wires going to the driver. Remove the driver by turning it counterclockwise. Make sure that the male threads are lightly greased, then install the new driver. Reconnect the wires as previously noted. Reinstall the inspection plate. Repeat resistance check above.

5. Test the siren to verify the driver has been properly installed.

B. Signal Operational Check

1. When checking for proper control module output, unplug the terminal strip connectors to the speakers (at the bottom of the system motherboard) to eliminate output from the speaker array.

2. Activate each of the signals and observe the signal indicators on the control module and the amplifiers.

3. If desired, an oscilloscope or digital multi-meter (DMM) can be connected to the amplifier module output terminal strip to observe the amplifier output. This output should be at least 67 Vrms during a signal. To limit sound output, plug in one amplifier terminal strip connector at a time during this test.

4. Plug all of the amplifier terminal strip connectors to enable amplifier outputs.

C. Battery Check

1. The voltage of a fully charged set of batteries should be approximately 27.2 VDC, and charger current should be less than 2 amps. The charger is set for 27.2 +/- 0.1 VDC at room temperature.

2. Load test the batteries per the manufacturer's specifications.

3. Some batteries are equipped with a built-in hydrometer. When the hydrometer "eye" is green, the battery is charged. If the "eye" is dark, the battery needs charging. If the "eye" is light in color, the battery is low on fluid and should be inspected for leaks. Maintain or replace the battery as recommended by its manufacturer; obey local or state laws governing the disposal of lead-acid batteries.

4. Check the battery terminals for corrosion. Clean and grease connectors and terminals, if necessary.

7.3 Adjustment Procedure for 2005026, 2005027 or 2005240 One Way Radio Receiver

Note: This procedure previously completed at factory. Only complete if radio re-alignment is required. Two-way radio adjustment procedure is in the next section.

A. Qualifications:

Radio shop and/or a properly trained radio technician.

B. Equipment Required:

1) Service Monitor
2) Oscilloscope
3) Digital Multimeter
4) Pickup loop- used to pick up close proximity RF from the VCO.
   A. Can be made from any non-polarity 0.1 uF cap and Oscilloscope cable.
      1) Solder one lead of the cap to the center lead of the O'scope cable.
      2) The other leads are not used and may be trimmed

C. Setup:

1. Connect the Unit Under Test (UUT) to the service monitor.

D. Receive audio adjustment

1. Modulate the correct RF signal into the receiver with a 1 kHz tone at 3 kHz deviation. If bandwidth is 12.5, then modulate at 1.5 kHz deviation.

2. Adjust the level at TP10 (2005141 controller card) for 1 $V_{p-p,}$ using the REC gain adjustment R59 (2005141 controller card front panel).

3. If this step fails to solve issue, then proceed with next steps, the complete radio alignment.

E. Checking the VCO frequency range

1. Monitor voltage on TP2 with a high impedance DC volt meter or scope.

2. The voltage on TP2 should be between 2 and 10 VDC for 2005026 and 2005027 receivers. The voltage should be greater than 3 VDC for 2005240 receivers.

3. The range of the VCO for 2005026 and 2005027 receivers, can be set by using a solder jumper to connect C68, C69, C70 and C71 to the VCO circuit. If the Steering line voltage is to low, connecting one or more of these caps into the circuit will increase the steering line voltage. Start with C68 and additional caps as needed to increase the voltage. For best receiver performance, this should be between 2 and 10 VDC.

F. Setting the Synthesizer on frequency

1. Set the service monitor to receive VCO frequency. Monitor the frequency of the VCO by placing a pickup loop on top of the VCO IC. This is U7 for 2005026 and 2005027 receivers or U9 for 2005240 receivers. (pickup loop requires no electrical connection to VCO, just close proximity).

2. The VCO frequency should be the receive frequency -21.4 MHz, unless the unit is a Lowband unit, in which case the frequency will be the receive frequency +21.4 MHz.

3. Adjust the frequency of the VCO using the trimmer cap in TCXO U1 until the frequency is within +/- 300 Hz.

G. Aligning the receiver and setting squelch

1. Using a service monitor set in generate mode, inject an unmodulated RF carrier signal into the receiver at a 100 µV carrier level. Open the squelch pot R1 fully open.

2. Using an analog DC voltmeter, monitor the DC voltage on TP1.

3. Adjust the coils in FL1 and then FL3 (FL1 and FL2 for 2005240 receivers) for the most voltage on TP1. TP1 may rise to about 2.0 Volts so it may be necessary to turn down the carrier level from the service monitor during the tuning process.

4. Set the carrier to a 0.5 µV level and re-tune the coils in FL1 and FL3 (FL1 and FL2 for 2005240 receivers) after the first pass through, as tuning the stages ahead of a coil can change it's tuning.

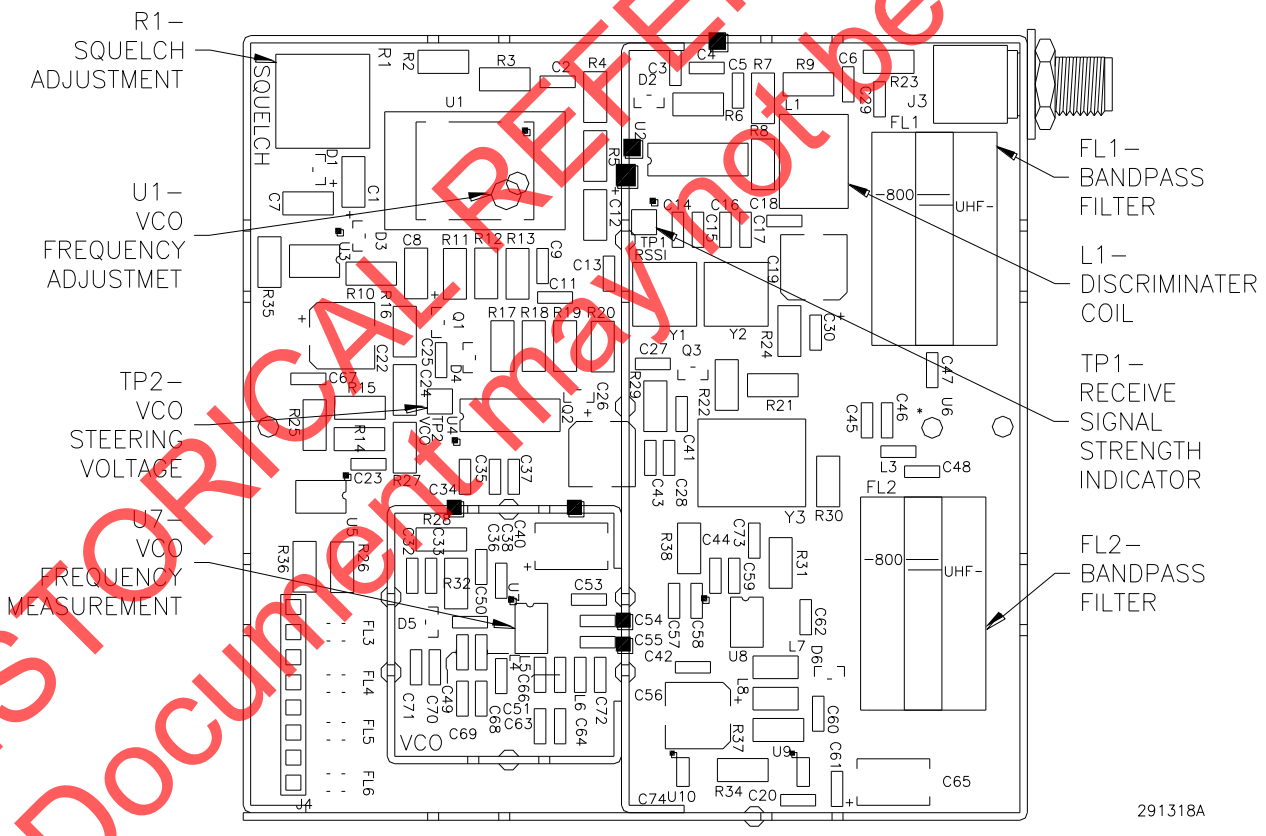
5. Modulate the signal into the receiver with a 1 kHz tone at 3 kHz deviation (1.5 kHz for narrowband receivers).

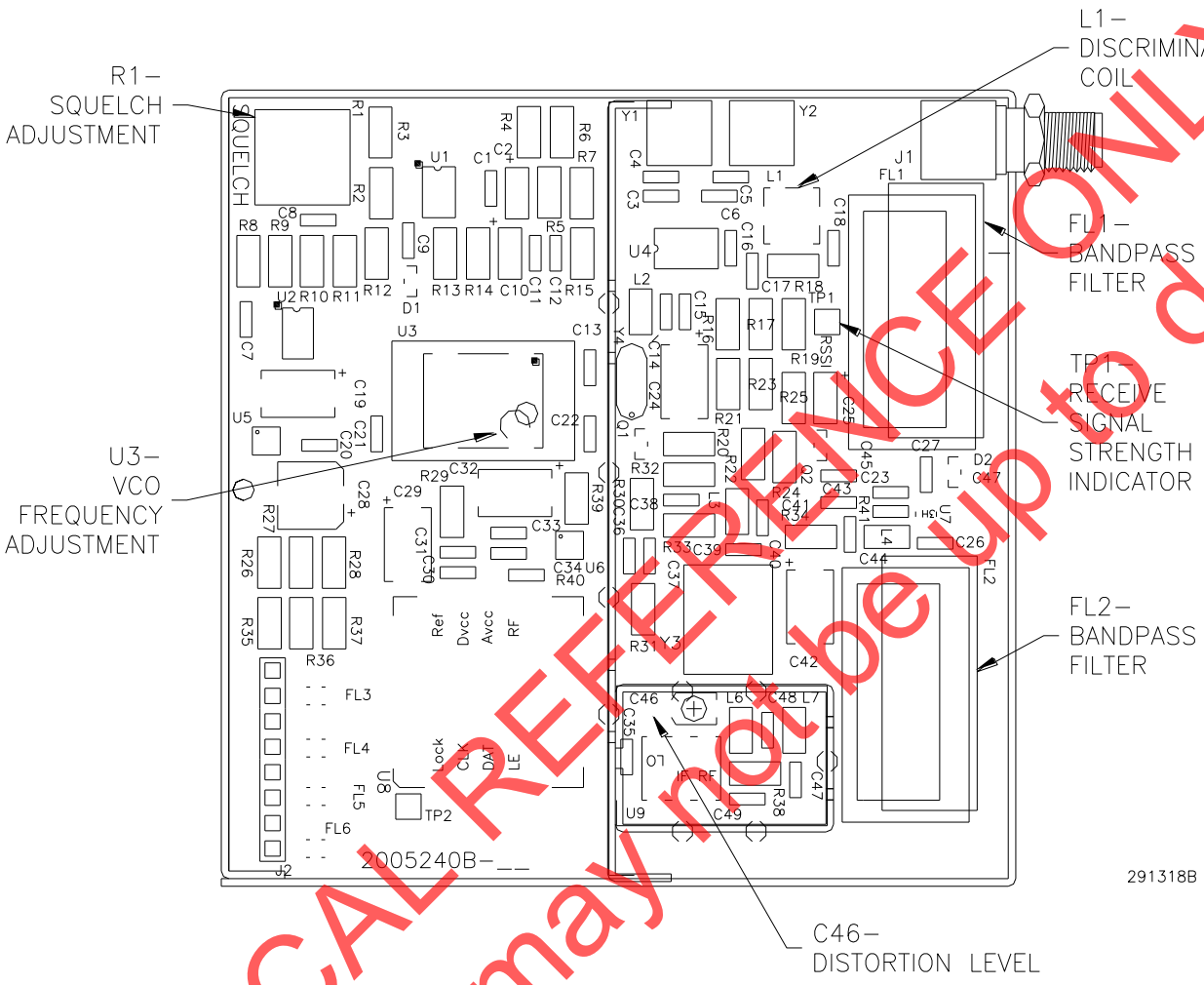
6. Monitor the receive audio, at the 2005141 controller card Rx test TP10, with oscilloscope and adjust coil L1 for the most level.

7. Adjust the level at TP10 (2005141 controller card) for

on the controller card and reduce the level of the RF signal from the service monitor until the SINAD meter reads 12 dB. The reading must be less than 0.35 µV.

9. Turn service monitor to .25 µV





7.4 Adjustment Procedure for a Two-Way Radio Receiver

Note: This procedure previously completed at factory. Only complete if radio re-alignment is required or radio is installed in the field.

A. Qualifications:

Radio shop and/or a properly trained radio technician.

B. Equipment Required:

1. Service Monitor
2. Oscilloscope

C. Setup:

1. Connect the Unit Under Test (UUT) to the service monitor.

D. Receive audio adjustment

1. Using service monitor, modulate the correct RF signal into the receiver with a 1kHz tone at 3 kHz deviation. If bandwidth is 12.5, then modulate at 1.5 kHz deviation. (If using private line, add 0.75 kHz private line deviation to the signal.)
2. Adjust the level at TP10 (2005141 controller card) for 1 V_{p-p} using the REC gain adjustment R59 (2005141 controller card front panel).

E. Transmit deviation adjustment

1. Simultaneously press buttons 5 & 7 on the 2005141 controller card. This will cause the controller to transmit for approximately 8 seconds
2. Measure the deviation level using service monitor set to the correct RF.
3. Adjust the TX level (2005141 controller card front panel) for 3 kHz deviation. If bandwidth is 12.5, then adjust for 1.5 kHz deviation. (If using private line, add 0.75 kHz private line deviation to the signal.)
4. If this step fails to solve issue, then check base station deviation levels as per base station documentation and manual. Also if used, check the repeater.

600-Ohm Adjustment Procedure for Activation Audio

Note: To use the 600-Ohm input for activation receive audio, at JP8 a jumper must be across pins 2-3. JP8 is located internally on the main controller card.

1. RX adjustment
   a. Transmit a tone from the base station.
      i. Ensure base station TX level was previously adjusted properly.
         1. Ensure tone is not clipped by viewing waveform with an oscilloscope.
         2. Nominal base station TX level would be 1 V_{p-p}

b. Adjust the level at TP10 (2005141 controller card) for 1 V_{p-p}
   i. REC gain adjustment R59 (2005141 controller card front panel).
      1. Ensure tone is not clipped by viewing waveform with an oscilloscope.

2. TX adjustment (If one way communication, then this step can be skipped)
   a. Simultaneously press buttons 5 & 7 on the 2005141 controller card. This will cause the controller to transmit for approximately 8 seconds.
   b. Determine proper siren TX level required.
      i. Nominal UV TX level would 1 V_{p-p}.
      ii. The TX levels for all of the siren controllers must be the same.
         1. Once one siren TX level is adjusted, all other sirens must be adjusted to the same level.
            a. Measured at the Base station.
   c. Adjust the TX level (2005141 controller card front panel) for the correct level determined above.
   d. Ensure tone is not clipped or distorted by viewing waveform with oscilloscope.

7.6 600-Ohm Adjustment Procedure for External Audio Source Input

Note: To use the 600 ohm input for external audio, at JP8 a jumper must be across pins 1-2. JP8 is located internally on the main controller card.

1. Audio source **adjustment** for **external audio source**.
   a. Transmit a tone from the external audio source.
      i. Ensure tone is not clipped or distorted by viewing waveform with an oscilloscope.
      ii. Nominal external audio source level would be 1 V_{p-p}.
      iii. If required adjust the external audio source.
2. Audio source **adjustment** for **UV controller**.
   a. Transmit a tone from the external audio source
   b. Contact closure at JP15 pins 10 and 11 (PTT: Push To Talk) is required to activate audio mode.
   c. Adjust the level using the external audio gain adjustment R111
   d. (R111 located internally on the 2005141 controller card circuit card).
      i. Preferred method of setting this level is to use a dB meter or by ear.
         1. Activate siren via external audio source.
         2. Set for same level as the standard siren sounds.

3. Ensure that the sound is not distorted.

7.7 Troubleshooting

	PROBLEM	ACTION
1.	NO RADIO DECODE	A. Unit was not armed before sending a DTMF function code (or) Unit is not programmed to recognize that particular code sequence (or) Signal is not being received properly. B. Verify programming is correct. Check the received audio signal quality at the RX test pin on the front of the control board.
2.	NO TWO TONE DECODE	Decoder not programmed. Check radio connections if external (see wiring diagram). Check for proper C/D polarity setting. Insure that radio is working properly by using a service monitor to inject a strong, clean signal. Check transmitter deviation.
3.	LOW OUTPUT FROM SPEAKER ARRAY	Check battery voltage. Check speaker impedance (see maintenance section). Also, check signal indicators on amplifiers during a function. If indicators are off, remove amplifier for service.
4.	FUNCTION STOPS BEFORE NORMAL TIME-OUT	Batteries may require further charging. Check battery voltage under load. Check charger output.
5.	LOCAL PA FEEDS BACK	Lower PA volume using knob above MIC connector.
6.	LOCAL PA HAS LITTLE OR NO OUTPUT	Hold MIC close to mouth. Increase PA volume using knob above MIC connector.
7.	BATTERIES NOT HOLDING CHARGE	Check that charger fuses are intact and check charger output. Load test batteries.
8.	EOWS*612 DOES NOT ROTATE	Check that the rotation relay on the system motherboard is operating (indicated by LED D2). Also check fuses F1 and F2 on

		motherboard.
	PROBLEM	**ACTION**
9.	RADIO PA TAKES TOO LONG TO TIME OUT	Check radio for proper operation of squelch. CD LED should light while carrier is present.
10.	LANDLINE ACTIVATION INPUTS DO NOT FUNCTION	Verify minimum 0.5 second contact closure is applied to JP14 on the motherboard.

NOTE: For additional help contact the FWS Service Dept. at (800) 524-3021.

SECTION VIII
OPTIONS

8.0 Radio Control

The siren can be activated by a radio signal when the optional radio receiver is incorporated into the Control Unit. Activation by radio control has the advantage that control lines are not required between the siren control site and the siren location. A suitable receiver in the Control Unit can control voice and tone signals. Federal Signal offers the controller with a full line of synthesized receivers built in which cover the low, high and UHF bands.

Federal Signal receivers are connected to a sealed female PL259 (SO239) cabinet mounted bulkhead connector. The antenna cable connection is made to the female PL259 (SO239) connector outside the cabinet. This connection should be protected from moisture. The antenna should be mounted facing the activating radio antenna per instructions provided with the antenna. See section 7 for radio adjustment procedure.

8.1 Two-Way Sensor Package

This option uses a variety of sensors in the ULTRAVOICE Series Controller, which when equipped with a two way radio allows the remote units to communicate their status back to the base station. This reduces station down time by quickly alerting operating personnel to potential problems at remote units.

The package itself consist of sensors to provide information on the following conditions:

1. AC Power
2. Battery Voltage (built in)
3. Charger Operation (built in)
4. Activation Current (built in)
5. Signal A (built in)
6. Signal B (built in)
7. Quiet Test (Amplifiers and Drivers built in)
8. Intrusion
9. Local activation/False Alarm
10. Amplifier Condition
11. Rotation (Rotating sirens only)

All sensors are optically coupled to provide protection in electrical interface conditions. Consult Federal Warning Systems for further information.

8.2 Local Quiet Test

This option allows performing Quiet Tests on the siren control and siren speaker array. Quiet Test uses a 20 kHz tone to quietly test the tone generators, amplifiers, and speaker drivers. To perform this test the Quiet Test must be programmed under one of the activation codes. If it is one of the first 7 codes then it can be activated manually through the switches on the front panel or with the remote activation inputs. Normally once the Quiet Test is programmed under one of the activation codes, the code is activated over the radio channel, the panel switches or

with a local laptop computer running SFCDWARE.

A. Operation

The results of a Quiet Test can be obtained remotely using the SS2000 printout or the SFCDWARE control and status monitoring software. The status can also be obtained locally at the siren site with a portable computer running SFCDWARE. The actual amplifier voltage and current are monitored with Quiet Test providing a true indication of each amplifier and load performance.

Calibration of the Quiet Test can be performed by pressing switches 2 & 3 on the front panel at the same time. Prior to performing a calibration the speakers must be known good, as per maintenance section.

B. Finding Faults

The siren automatically will do a reset when running a Quiet Test. Reset prior to a Quiet Test is not required. After a test, the siren must be polled from the SS2000. The SS2000 printout will indicate the present siren status.

When using SFCDWARE, the controller will automatically update the Quiet Test status each time a new Quiet Test is run. The status can be obtained from the status detail screen and from the Reports menu.

8.3 Digital Voice

When purchased, the Digital Voice option adds a unit that is capable of playing up to 4 minutes of factory prerecorded messages in any sequence from 16, 15-second messages to 4, 1-minute messages.

The Digital Voice system can be activated by using the radio receiver or the siren controller panel switches. To program activation codes with Digital Voice Messages under them; follow the instructions in the programming software. It is possible to assign codes to the functions DIG VOICE 1 through DIG VOICE 16. As in all sounding functions, the unit must first receive the ARM command followed by one of the six DIG VOICE commands to activate the stored message. The Digital Voice Volume is adjustable via a potentiometer located on the controller front panel, called DV Gain.

8.4 Installation of Other Manufacturers' Radio Receivers in UltraVoice Siren Controllers

CAUTION

Improper installation of radio control equipment may cause the siren to malfunction or operate intermittently. Installation must only be performed by experienced radio technicians who have thoroughly read this manual.

1. TUNING - Tune the radio receiver to the manufacturer's specifications.

2. POWER - Determine the radio power requirements. The ULTRAVOICE control panel provides +12 VDC on the RADIO connector on the front panel, as shown below;

   RADIO Connector, 8 pin MOD jack;
   1. Receive Audio,150 mV-10 V_{p-p}
   2. Transmit Audio, 50 mV-3 V_{p-p}
   3. Carrier Detect - active low
   4. PTT - active low
   5. +12 VDC
   6. GND
   7. +12 VDC
   8. GND

   This voltage source must not be used for radios, which draw more than 1.5 Amps of current in transmit. Use both grounds and both +12 VDC connections for current handling. If a higher current output is required, a 24 VDC – 12 VDC voltage converter must be purchased. This converter is provided with the UVT series models. Do not use one of the 12 VDC batteries to run the radio equipment.

1. AUDIO – The ULTRAVOICE controller Receive Audio input should be connected to the de-emphasized audio output of the radio. Use shielded audio grade cable and keep wire runs as short as possible. The receive audio level can vary from 150 mV – 3 V_{p-p} unclipped.

2. The Transmit Audio output is adjustable from 50 mV - 3 V_{p-p}.

3. C.D. - The carrier detect signal from the radio must pull to ground when active. The radio carrier detect signal is useful for controlling live PA. When the C.D. signal is removed from the controller for over 5 seconds, the controller will automatically cancel the PA function eliminating the need to broadcast the cancel tones over the siren.

4. PTT – The PTT output pulls to ground when active to key the radio.

8.5 Serial Port Control

All control functions may be activated by the serial port control using 7 character ASCII strings.

Serial port configuration:

Flow Control	None (three wire interface)
Baud Rate	1200
Parity	None
Data Bits	8
Stop Bits	1

Serial command dictionary:

*_ARM__	
*CANCEL	
*_VOICE	Public Address
*Q_TEST	
*DISARM	
*ZONEA_	Rotate to Zone A.
*ZONEB_	
*ZONEC_	
*ZONED_	
*REPORT	
*RESET_	Cancel any functions and clear latched status bits.
*MSG_A_	Digital voice MSG1
*MSG_B_	
*MSG_C_	
*MSG_D_	
*MSG_E_	
*MSG_F_	
*MSG_G_	
*MSG_H_	
*MSG_I_	
*MSG_J_	
*MSG_K_	
*MSG_L_	
*MSG_M_	
*MSG_N_	
*MSG_O_	
*MSG_P_	Voice MSG 16
.*_WAIL_	
*P_WAIL	
*A_WAIL	
*STEADY	
*P_STDY	
*A_STDY	
*_AUX__	
*PHASE+	Enable turbo mode forward direction
*PHASE-	Enable turbo mode Backward direction
*LOWPWR	Low Power Mode
*xxxxxx	Zone command: x = 1 for enable zone; x = 0 for disable zone.
CODExx	**xx = user program number to run (1-50).**

Example:*CODE01 will run program 01; *CODE02 will run program 02

8.6 Status Monitoring:

The UltraVoice siren controller monitors various diagnostic conditions for reporting back to a central monitoring station using optional control and status monitoring hardware and software.

Status items monitored:

Siren Type
Function State (Code running)
Unit ID

Amplifier status for each amp in the unit depending on siren type*
Audio A*
Audio B*
Master Current*
Battery *
Charger
AC Power
Control Box Intrusion
Battery Box Intrusion
False Alarm/Local Activation*
Rotation*

* Latched Items -- remain set until reception of a Reset command or another function is run.

Status information is transmitted either as a DTMF or FSK data string over the communications channel and as an ASCII string over the RS-232 port. Report back transmission will occur when one of two conditions exist:

1) Reception of a REPORT command or
2) One of the asynchronous status conditions changes state.

8.7 DTMF Report Format

Digit #	Description
1	**Start Character**, always a DTMF "*"
2	**Unit Type** programmed into unit (see Unit Type Definition)
3	**Code Number Active** most significant digit (see Code Number Definition)
4	**Code Number Active** least significant digit (see Code Number Definition)
5	**Unit Number**, BCD most significant digit
6	**Unit Number**, BCD middle digit
7	**Unit Number**, BCD least significant digit
8	**Sensor Status,** Amplifiers 1-4 Bit 1 = Amp 1 (Bit = 1 = Not Active) Bit 2 = Amp 2 Bit 3 = Amp 3 Bit 4 = Amp 4
9	**Sensor Status,** Amplifiers 5-8 Bit 1 = Amp 5 Bit 2 = Amp 6 Bit 3 = Amp 7 Bit 4 = Amp 8
10	**Sensor Status,** Amplifiers 9-12 Bit 1 = Amp 9 Bit 2 = Amp 10 Bit 3 = Amp 11 Bit 4 = Amp 12
11	**Sensor Status** Bit 1 = Battery (0 = Battery Okay) Bit 2 = Master Current (0 = At least one amp drawing current) Bit 3 = Audio B (0 = Audio Present) Bit 4 = Audio A (0 = Audio Present)
12	**Sensor Status** Bit 1 = Intrusion Cabinet 1 (0 = Door Closed) Bit 2 = Not used Bit 3 = AC Power (0 = Ac Power On) Bit 4 = Charger (1 = Charger On)
13	**Sensor Status** Bit 1 = Rotation (0 = Rotation Occurred) Bit 2 = Not Used Bit 3 = Spare (0 = Spare Closed) Bit 4 = False Alarm (0 = False alarm occurred)
14	**Terminating Character**, always a DTMF "*"

Conversion of DTMF Digit to BCD and ASCII Equivalent

DTMF Character	BCD Equivalent	ASCII Equivalent
1	0 0 0 1	1
2	0 0 1 0	2
3	0 0 1 1	3
4	0 1 0 0	4
5	0 1 0 1	5
6	0 1 1 0	6
7	0 1 1 1	7
8	1 0 0 0	8
9	1 0 0 1	9
0	1 0 1 0	:
*	1 0 1 1	;
#	1 1 0 0	<
A	1 1 0 1	=
B	1 1 1 0	>
C	1 1 1 1	?
D	0 0 0 0	0

Unit Types

DTMF Character	Siren Types	Number of Amps Monitored
4	MOD1004	2
5	MOD2008	4
6	MOD3012	6
7	EOWS-612	6
8	MOD4016	8
9	MOD5020	10
0	MOD6024 & MOD6048	12
*	Custom	0

Note: Two amplifiers exist in each physical amplifier assembly. Each amplifier section is reported on separately except in the MOD6048 type which bridges two amplifier sections into one status report.

Code Number Active	
DTMF Characters	Function
DD	Standby
D1	Code 1
D2	Code 2
D3	Code 3
.	
.	
D9	Code 9
1D	Code 10
11	Code 11
.	
19	Code 19
2D	Code 20
.	
.	
.	
49	Code 49
5D	Code 50

Note: Code numbers refer to a programming block of siren functions that have been programmed into the siren controller using the MCP Windows programming software.
Refer to the example report string on the following page.

Example DTMF Report String

Received DTMF report string = *** 0 D 3 D D 5 7 C 1 0 B 6 ***

	Description of Status Report	
*	Starting character	
0	Siren type MOD6024 (six amplifiers)	
D3	Currently running code (0000) (0011) which equals the number 03.	
DD5	Siren site number (0000) (0000) (0101), which equals site number 005	
7	Sensor status is (0111),	Bit 1 is 1, Amp 1 is bad or not active Bit 2 is 1, Amp 2 is bad or not active Bit 3 is 1, Amp 3 is bad or not active Bit 4 is 0, Amp 4 is active and good
C	Sensor status is (1111),	Bit 1 is 1, Amp 5 is bad or not active Bit 2 is 1, Amp 6 is bad or not active Bit 3 is 1, Amp 7 is bad or not active Bit 4 is 1, Amp 8 is bad or not active
1	Sensor status is (0001),	Bit 1 is 1, Amp 9 is bad or not active Bit 2 is 0, Amp 10 is active and good Bit 3 is 0, Amp 11 is active and good Bit 4 is 0, Amp 12 is active and good
0	Sensor status is (1010),	Bit 1 is 0, Battery is good Bit 2 is 1, Master Current is not active Bit 3 is 0, Signal B is active Bit 4 is 1, Signal A is not active
B	Sensor status is (1110),	Bit 1 is 0, Intrusion has not occurred in cabinet 1 Bit 2 is 1, Not used Bit 3 is 1, AC power is off Bit 4 is 1, Charger is active
6	Sensor status is (0110),	Bit 1 is 0, Rotation has occurred Bit 2 is 1, Not used, input not active Bit 3 is 1, Spare is not active Bit 4 is 0, False alarm has occurred
*	Terminating character	

For serial transmission, the above report string is converted to an 8-bit ASCII value by adding an offset of 30 Hex.

8.8 Serial Report Format

The serial report string has been preserved from the MC series siren controller to maintain compatibility. It has been expanded from the previous series controllers to include the ability to report code numbers as is done with the DTMF report string while still keeping the capability to report directly addressed functions.

The serial string has one function state character making it one character shorter than the DTMF string. Unit types are the same as for the DTMF report format described in the previous section. Also refer to the previous section for the BCD equivalent of the ASCII codes.

For information on serial control strings, see Section 1.5 of this manual.

Serial Function State Definitions

ASCII Char.	Function State
0	Wail
1	Pulsed Wail
2	Alt. Wail
3	Steady
4	Pulsed Steady
5	Alt. Steady
6	Aux
7	Alarm
8	Quiet Test
9	Cancel
:	Public Address
;	Armed
<	Standby
=	Digital Voice
A	Code 1
B	Code 2
C	Code 3
.	
.	
.	
p	Code 48
q	Code 49
r	Code 50

Serial Report Format

Digit #	Description
1	**Start Character**, always an ASCII semicolon
2	**Unit Type** programmed into unit (see Unit Type Definition)
3	**Function State (or code #) Active** (see Serial Function State Definitions)
4	**Unit Number**, BCD most significant digit
5	**Unit Number**, BCD middle digit

6	**Unit Number**, BCD least significant digit
7	**Sensor Status,** Amplifiers 1-4 Bit 1 = Amp 1 (Bit = 1 = Not Active) Bit 2 = Amp 2 Bit 3 = Amp 3 Bit 4 = Amp 4
8	**Sensor Status,** Amplifiers 5-8 Bit 1 = Amp 5 Bit 2 = Amp 6 Bit 3 = Amp 7 Bit 4 = Amp 8
9	**Sensor Status,** Amplifiers 9-12 Bit 1 = Amp 9 Bit 2 = Amp 10 Bit 3 = Amp 11 Bit 4 = Amp 12
10	**Sensor Status** Bit 1 = Battery Bit 2 = Master Current Bit 3 = Audio B Bit 4 = Audio A
11	**Sensor Status** Bit 1 = Intrusion Cabinet 1 Bit 2 = Not Used Bit 3 = AC Power Bit 4 = Charger
12	**Sensor Status** Bit 1 = Rotation Bit 2 = Not Used Bit 3 = Spare Bit 4 = False Alarm
13	**Terminating Character**, always an ASCII semicolon

Example Serial Report String

Received serial report string = **; 0 3 0 0 5 7 ? 1 : > 6 ;**

	Description of Status Report	
;	Starting character	
0	Siren type MOD6024 (six amplifiers)	
3	Function state = 3 corresponding to a Steady siren function	
005	Siren site number (0000) (0000) (0101), which equals site number 005	
7	Sensor status is (0111),	Bit 1 is 1, Amp 1 is bad or not active Bit 2 is 1, Amp 2 is bad or not active Bit 3 is 1, Amp 3 is bad or not active Bit 4 is 0, Amp 4 is active and good
?	Sensor status is (1111),	Bit 1 is 1, Amp 5 is bad or not active Bit 2 is 1, Amp 6 is bad or not active Bit 3 is 1, Amp 7 is bad or not active Bit 4 is 1, Amp 8 is bad or not active

1	Sensor status is (0001),	Bit 1 is 1, Amp 9 is bad or not active Bit 2 is 0, Amp 10 is active and good Bit 3 is 0, Amp 11 is active and good Bit 4 is 0, Amp 12 is active and good
0	Sensor status is (1010),	Bit 1 is 0, Battery is good Bit 2 is 1, Master Current is not active Bit 3 is 0, Signal B is active Bit 4 is 1, Signal A is not active
>	Sensor status is (1110),	Bit 1 is 0, Intrusion has not occurred in cabinet 1 Bit 2 is 1, Not used Bit 3 is 1, AC power is off Bit 4 is 1, Charger is active
6	Sensor status is (0110),	Bit 1 is 0, Rotation has occurred Bit 2 is 1, Not used, input not active Bit 3 is 1, Spare is not active Bit 4 is 0, False alarm has occurred
;	Terminating character	

8.9 Solar Power Option

When purchased, the Solar option allows the siren to operate in areas where AC power isn't available. Our PVS2110-24 model for the UltraVoice includes a solar regulator and the solar panel kit. When installed, the batteries are charged by the battery charger via the photovoltaic charging system providing operational power to the siren.

8.10 UV25ST Option

When purchased, the UV25ST allows the end-user the capability to reduce audio output from the 70 VRMS standard to the 25 VRMS standard. This option is beneficial when deploying the UltraVoice electronic controller in an indoor warning application.

The UV25ST has a similar form and fit as the UV400 amplifier. In an indoor application, the UltraVoice controller can accommodate up to (4) UV400 amplifiers and (4) UV25ST. For every UV400 amplifier utilized, a corresponding UV25ST must be purchased.

The UV25ST plug into the unused amplifier slots following the UV400 amplifiers.

8.11 FS-SINAD Option

The SINAD Meter board is a small add-on board option that plugs into the siren controller. This gives the user the ability to measure the quality of the received RF signal reaching a Remote Terminal Unit (RTU). This option is only available on the SFCDWARE two-way communication system (SFCDWARE version 7_22 and later). The SFCDWARE system indicates the SINAD of the RTU through the selection of the SINAD test. See SFCDWARE help file for details. This enables the ability to track changes, which may indicate a degradation or failure in the receiving system. The on-board display also provides personnel in the field a way to visually confirm the quality of the received signal.

The truest measure of a decoder ability to perform its function is the ratio of signal to noise and distortion arriving at the decoder. The received audio that the decoder must decode contains the intended signal plus any noise and distortion. Many things can cause noise and distortion such as low transmitter power, terrain or weather conditions, a malfunctioning receiver or its antenna, or even other nearby transmitters. The fact that this measure of signal to noise and distortion ratio encompasses any and all things, which have affected the received audio, makes it a valuable measure for predicting the decoder's ability to do its job.

This board measures the SINAD of a received 1200 Hz signal. The measured SINAD is passed to the processor of the FCM and also displayed on 10 LEDs on the SINAD Meter board. When the lowest LED lights, the SINAD is 3 dB and each successive LED is another 3 dB, up to 30 dB SINAD. Acceptable SINAD is 18 dB.

Features:

- SFCDWARE software indication of RTU SINAD
- Accuracy to +/- 1 dB
- Visual Display in 3 dB steps from 3 dB SINAD to 30 dB SINAD
- Easy installation on existing controllers

8.12 Model UVTD-IP

The UVTD-IP combines the characteristics of a UVTD with Serial to Ethernet conversion capabilites. This allows serial devices to communicate over an Ethernet network and provides audio decoding of digitized audio sent over the network.

The converter is configured with its own fixed IP address and port number. When packets of data are received over the Ethernet port that are addressed to the board's IP and port number, they are converted to serial data and sent out over the serial port. Likewise, any

data coming into the serial port is converted to TCP/IP data packets and sent out over the Ethenet port to the server's IP address. The unit also contains a digital to analog converter. This allows specially configured incoming data packets to be converted to audio, which is then filtered and sent out over a 600 ohm audio port.

A. Ethernet Board Specifications

Electrical

Input Voltage	10.5 - 95VDC
Current Draw	<150 mA

Serial Port

Serial Port Protocol	RS232C, N, 8, 1 baud rate configurable

Ethernet Port

Protocol	IEEE 802.3, 10 Base-T connection

600 Ohm Audio Output Port

Protection	MOV and Transorb surge protection
Impedance	600 ohms
Audio Output Level (-17 dB to +2.7 dB) into 600 Ohms	Adjustable from 0.30 to 3.00 V_{p-p},

*NOTE: To use the 600 ohm input for activation receive audio, a jumper must be across pins 2-3 at JP8. JP8 is located on the main controller card. Refer to section '600-Ohm Adjustment Prodcedure for Activation Audio'.

Connectors

JP1 600 Ohm Audio Output Port
Balanced line output

JP2 JTAG Emulation port

JP3 Audio Output Expanded or Flat Selection Jumper
Jumpers pins 1 & 2 for flat audio output
Jumpers pins 2 & 3 for expanded dynamic range audio output

JP4 RS232 Serial Port
1 -
2 -
3 - Ground, 0.5 amps maximum current capacity
4 - Radio transmit data from PC, standard RS232 levels

5 - Radio receive data to PC, standard RS232 levels
6 - Ground, 0.5 amps maximum current capacity

JP5 FLASH Programming and Converter Configuration Port
1 -
2 - TX Data, standard RS232 levels
3 - RX Data, standard RS232 levels
4 - Ground
5 - Serial Clock input for FLASH programming, standard RS232 levels
6 - Processor Reset Not line, used in programming FLASH, 10K pull-up

JP6 10.5-95VDC Power Input
1 - (-)
2 - (+)

JP7 Resets board back to factory default settings.

J1 Ethernet Network Port
1 & 2 - Transmit data pair, balanced line
3 & 6 - Receive data pair, balanced line
4, 5, 7, 8 - AC coupled ground

Indicators

D1 - CPU Heartbeat indicator, green
D2 - Transmit data indicator, red
D3 - Receive data indicator, yellow
D4 - Power indicator, green

Controls

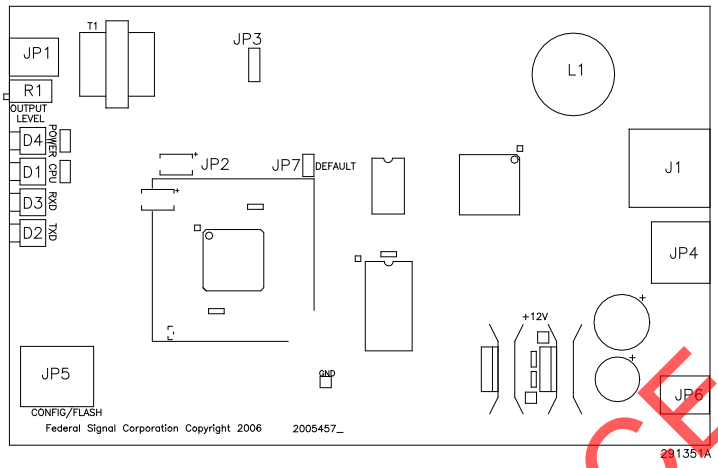
R1 – 600 ohm audio output level set

Environmental

Operating Temperature	-30 °C - +65 °C
Humidity	0- 95% non-condensing

Physical

Dimensions	~ 2” height, 4” width, 6.5" length.
Weight	< 2 lbs



Serial to Ethernet Board

B. Network Information

Protocols Supported

- TCP/IP
- UDP (optional)
- XML (optional)
- XMPP (optional)

IP Ports Used

16,887 (Codespear TCP/IP)
80 (HTTP)
3100 (optional UDP Serial Over IP)
3101 (optional UDP Voice Over IP)

IP Address

User selectable

TOS/DSCP (Type of Service)

User selectable

Bandwidth Requirements

Voice Over IP:	150K baud per connection
Siren Activation:	50 bytes per connection
Siren Poll Response:	74 bytes per connection

8.13 UV6048 Satellite Models

The UV6048 Satellite models have been designed to allow two-way communication through the use of satellites.

SATELLITE RECEIVER MODULE
The satellite receiver module is a two-way communicator board that plugs into the card cage within the siren controller. The unit receives satellite signals and converts to RS232 data and audio for delivery to the siren control module.

The Lock LED will blink when the module receives a good signal. The receiver decodes audio from the satellite and provides an audio output that connects to the siren control board. The receiver provides a contact closure output that gates the 600-ohm audio input to the siren controller.

LNB AMPLIFIER
The LNB is a low noise block amplifier responsible for lowering the high frequencies in the satellite signals. The Uplink allows for the transmitting of signals from the siren to the AeroAstro web servers.

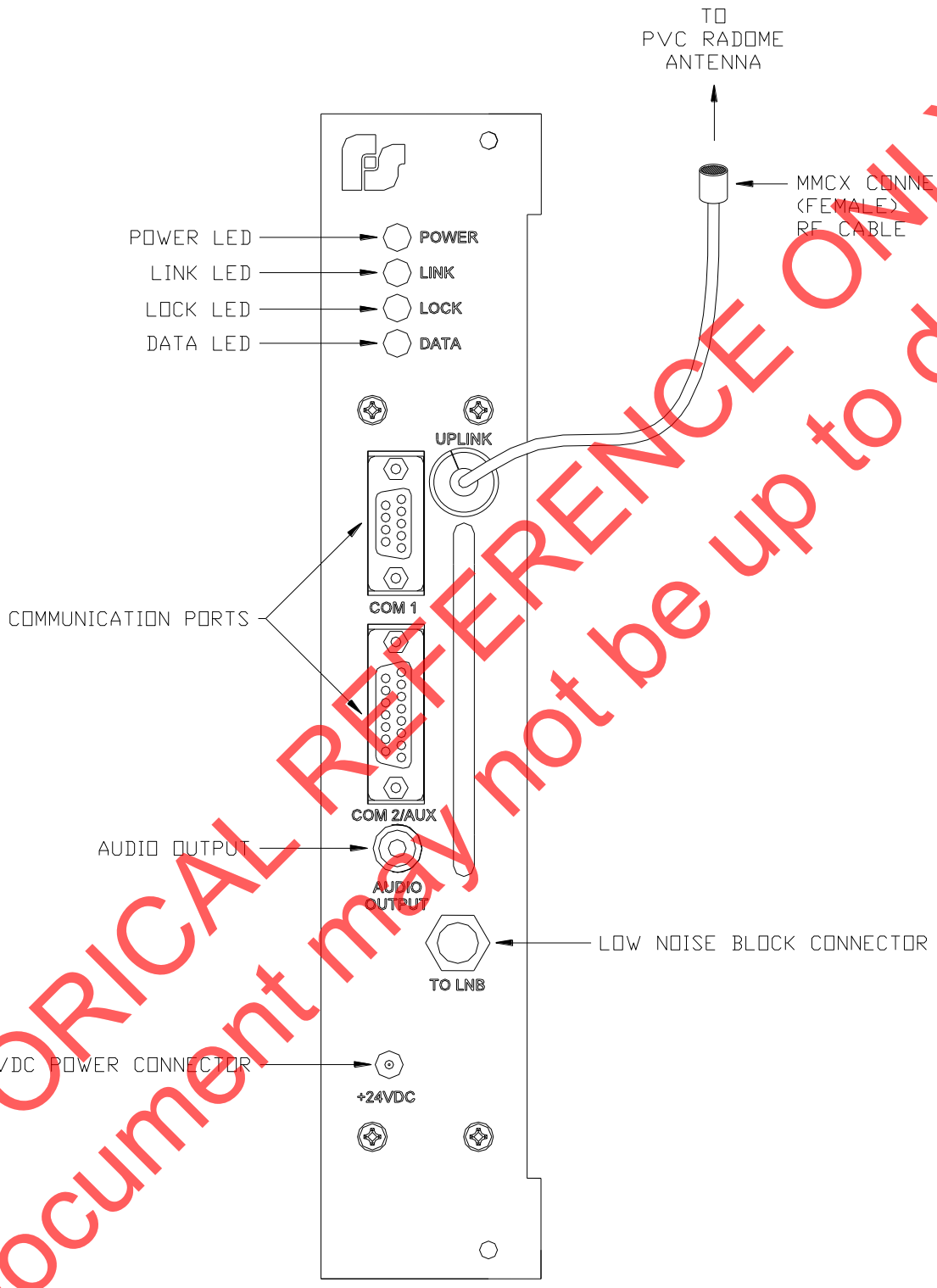
DATA UPLINK
The Receiver module also includes a Globalstar satellite uplink that transmits serial data from the siren controller back to the front end control point.

UPLINK ANTENNA
The Uplink antenna is a weather proof cabinet mounted LHCP antenna that transmits in the 1610 MHz range.

AEROASTRO
AeroAstro receives data packets from the Globalstar network and provides this data to the Federal Signal data web server over the internet. This server then forwards the data to the Commander siren control and status monitoring software.

DTMF DECODER
Local DTMF radio activation is done through the use of a 1-way receiver module within the UV controller.

STROBE LIGHT
A strobe light has been added to the siren to provide visual warning. Circuit protection for this light is provided through the use of a 6 Amp fuse on the UV motherboard.



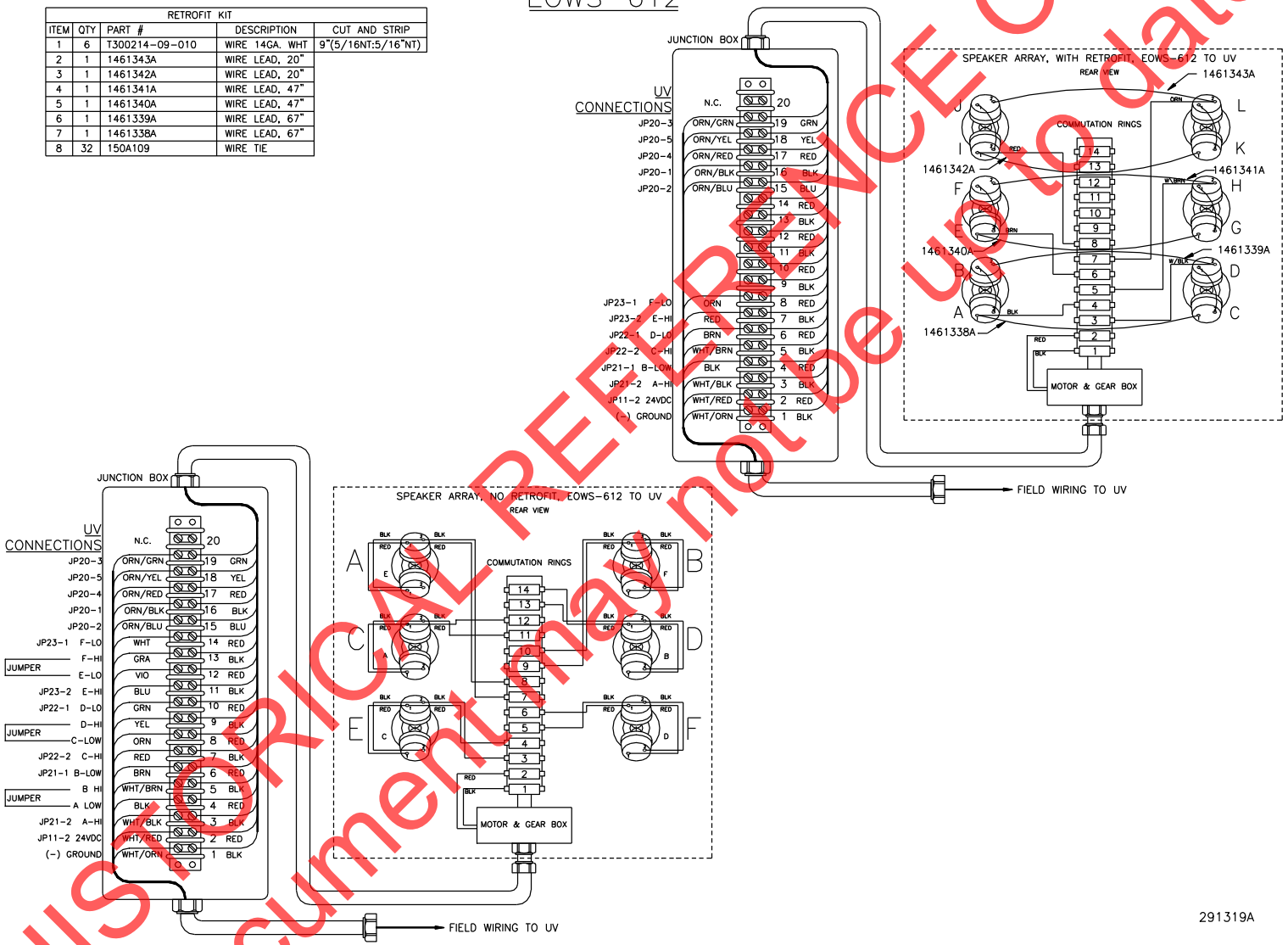
SATELLITE RECEIVER MODULE

291353A

SECTION IX APPENDIX A

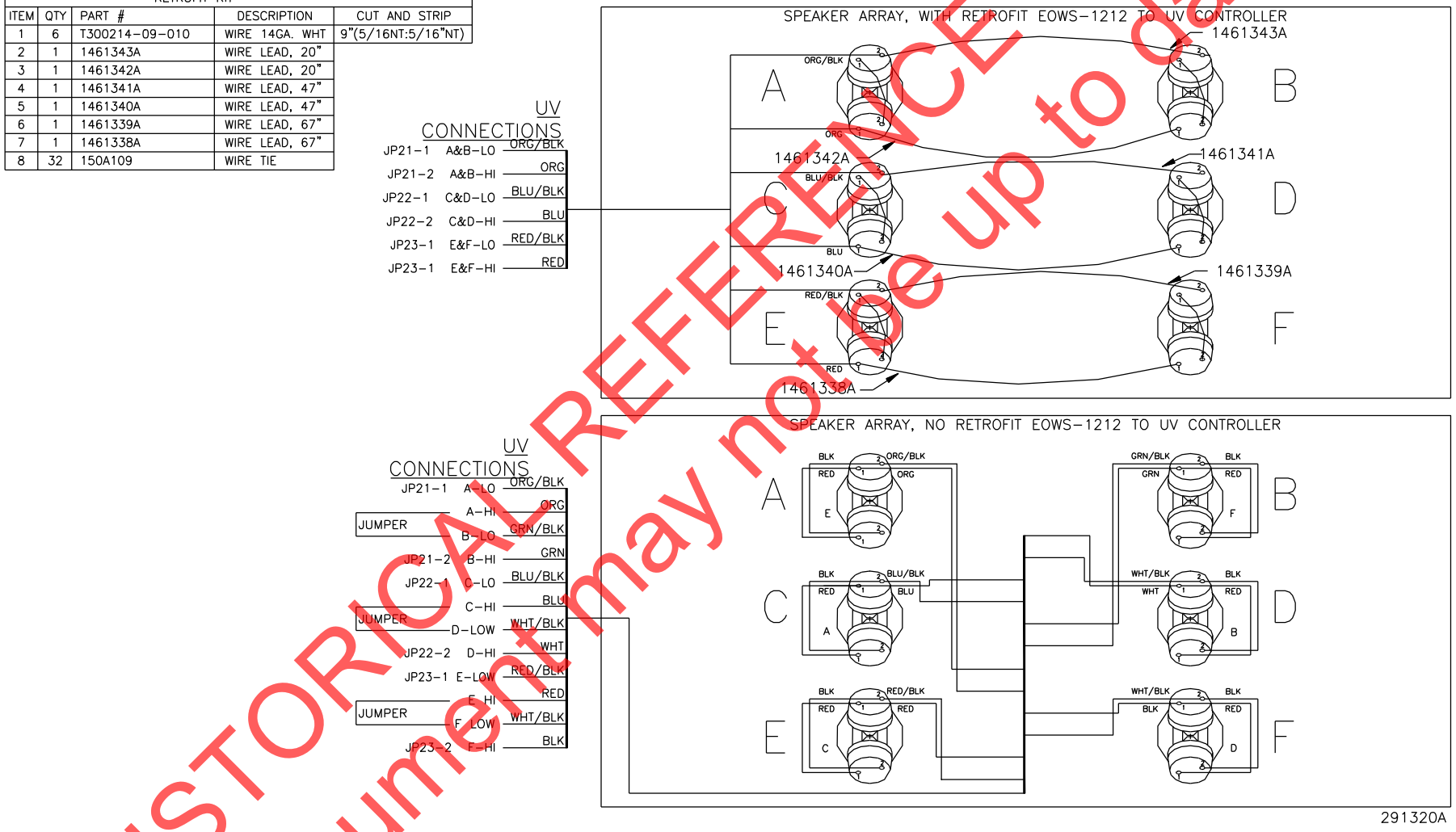
EOWS-612

RETROFIT KIT				
ITEM	QTY	PART #	DESCRIPTION	CUT AND STRIP
1	6	T300214-09-010	WIRE 14GA. WHT	9"(5/16NT:5/16"NT)
2	1	1461343A	WIRE LEAD, 20"	
3	1	1461342A	WIRE LEAD, 20"	
4	1	1461341A	WIRE LEAD, 47"	
5	1	1461340A	WIRE LEAD, 47"	
6	1	1461339A	WIRE LEAD, 67"	
7	1	1461338A	WIRE LEAD, 67"	
8	32	150A109	WIRE TIE	



EOWS-1212

RETROFIT KIT				
ITEM	QTY	PART #	DESCRIPTION	CUT AND STRIP
1	6	T300214-09-010	WIRE 14GA. WHT	9"(5/16NT:5/16"NT)
2	1	1461343A	WIRE LEAD, 20"	
3	1	1461342A	WIRE LEAD, 20"	
4	1	1461341A	WIRE LEAD, 47"	
5	1	1461340A	WIRE LEAD, 47"	
6	1	1461339A	WIRE LEAD, 67"	
7	1	1461338A	WIRE LEAD, 67"	
8	32	150A109	WIRE TIE	

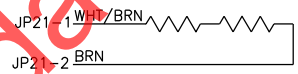


REVISED DSA AND DSA RETROFIT WIRING FOR ULTRAVOICE CONTROLLERS

NOTE: IMPROPER INSTALLATION WILL RESULT IN DAMAGE TO THE DRIVERS.
IN THE REVISED AND RETROFIT DSA CONFIGURATIONS, DRIVERS ARE IN A SERIES RESISTIVE CONFIGURATION.
EACH SET OF SERIAL CONFIGURATION DRIVERS CAN HANDLE HALF OF THE WATTAGE OUTPUT. THEREFORE EACH SET OF SERIAL CONFIGURATION OF DRIVERS CAN BE PUT IN PARALLEL, WITH ANOTHER SET OF SERIAL CONFIGURATION DRIVERS, UP TO 4 DRIVERS PER AMPLIFIER.
* ODD NUMBER DSA REQUIRES ANOTHER ODD NUMBER DSA TO ACHIEVE THE EXTRA REQUIRED DRIVER.

PROPER WIRING FOR USAGE OF FULL WATTAGE OUPUT OF AMP

PROPER WIRING FOR USAGE OF HALF WATTAGE OUTPUT OF AMP



WRAP ANY UNUSED DRIVER LEADS WITH ELECTRICAL TAPE.

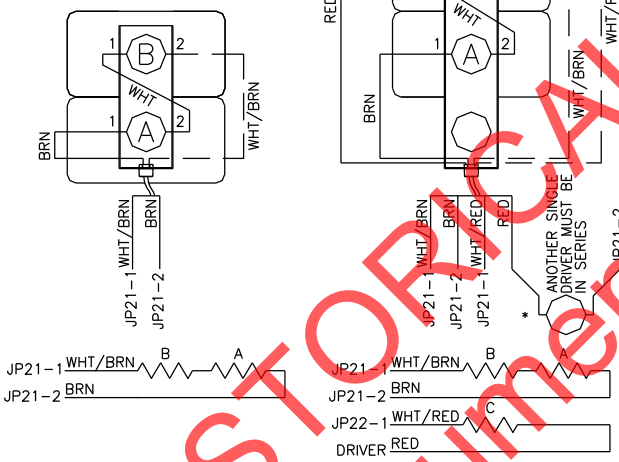
DSA2

DSA-UV-KIT
(RETROFIT KIT)

REMOVE BRN LEAD TO B-1

DISCONNECT WHT/BRN LEAD TO A-2

ADD WHT JUMPER

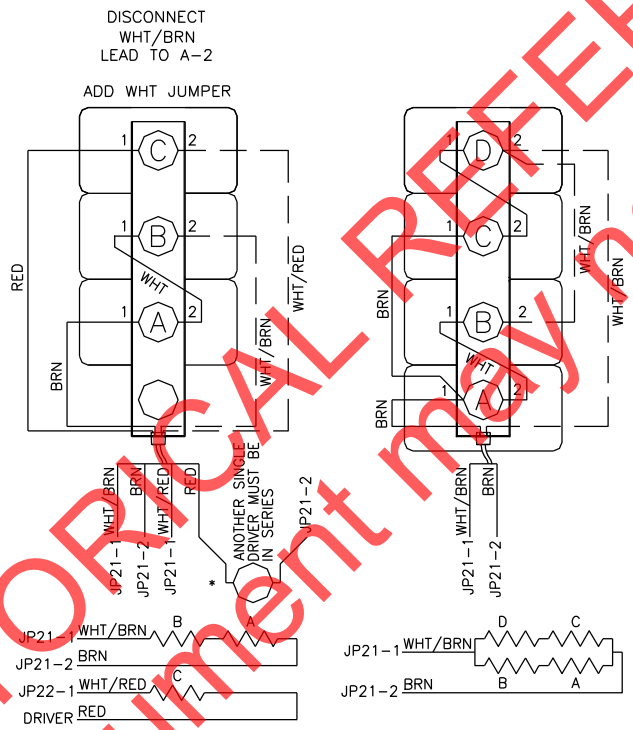


DSA3

DSA-UV-KIT
(RETROFIT KIT)

DISCONNECT WHT/BRN LEAD TO A-2

ADD WHT JUMPER

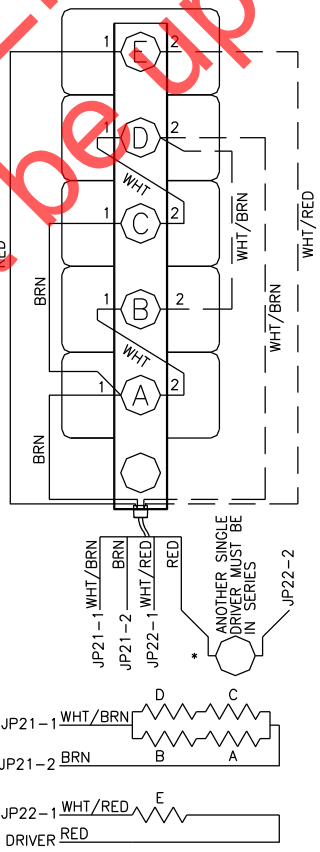


DSA4

DSA4-UV-KIT
(RETROFIT KIT)

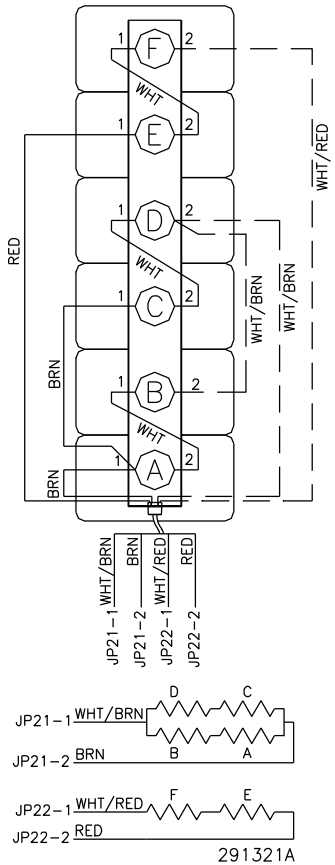
DSA5

DSA5/6-UV-KIT
(RETROFIT KIT)



DSA6

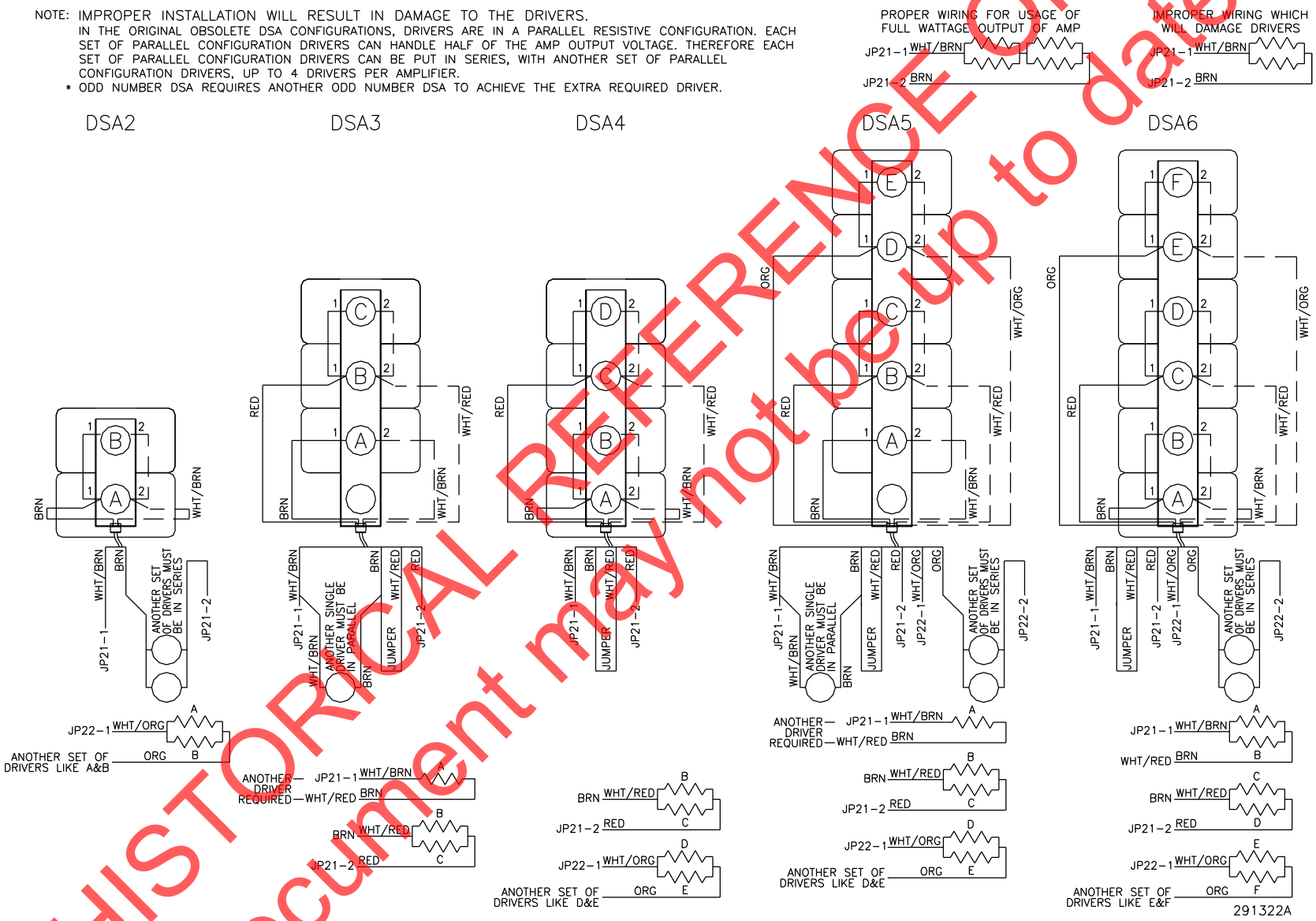
DSA5/6-UV-KIT
(RETROFIT KIT)



291321A

ORIGINAL DSA WIRING FOR ULTRAVOICE CONTROLLERS NOT USING THE RETROFIT KIT

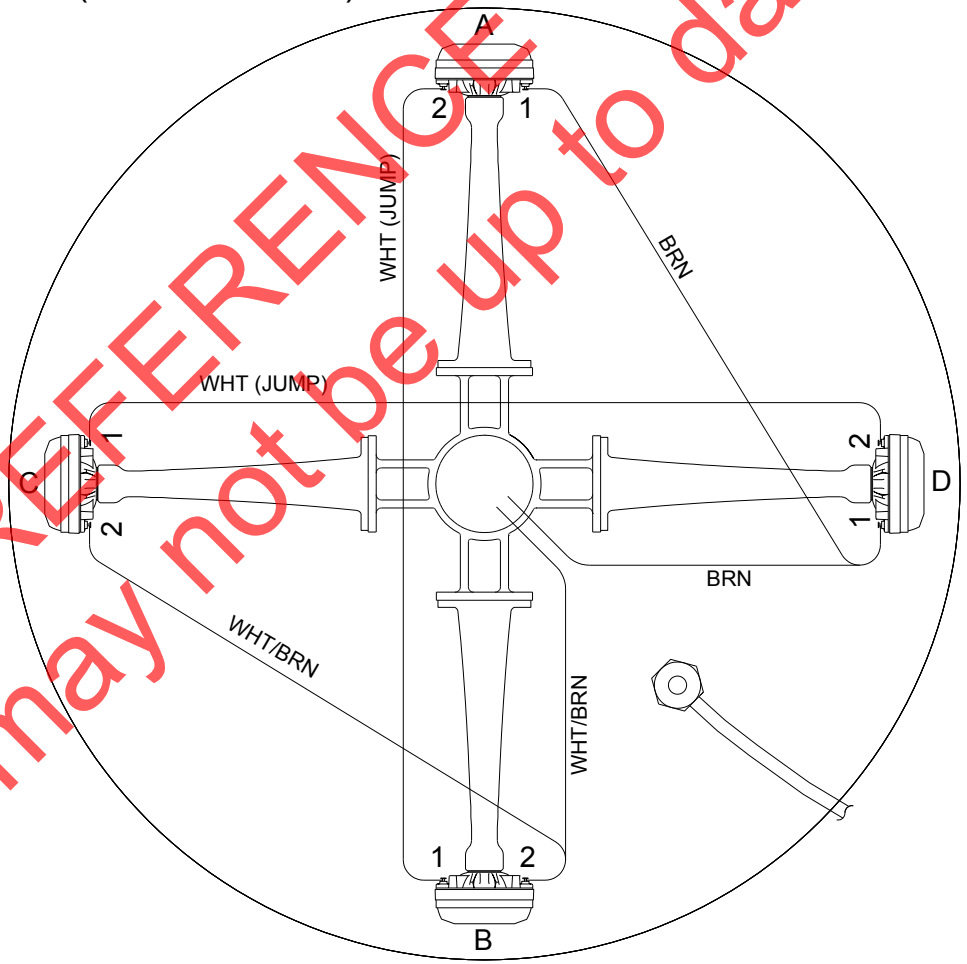
NOTE: IMPROPER INSTALLATION WILL RESULT IN DAMAGE TO THE DRIVERS.
IN THE ORIGINAL OBSOLETE DSA CONFIGURATIONS, DRIVERS ARE IN A PARALLEL RESISTIVE CONFIGURATION. EACH SET OF PARALLEL CONFIGURATION DRIVERS CAN HANDLE HALF OF THE AMP OUTPUT VOLTAGE. THEREFORE EACH SET OF PARALLEL CONFIGURATION DRIVERS CAN BE PUT IN SERIES, WITH ANOTHER SET OF PARALLEL CONFIGURATION DRIVERS, UP TO 4 DRIVERS PER AMPLIFIER.
* ODD NUMBER DSA REQUIRES ANOTHER ODD NUMBER DSA TO ACHIEVE THE EXTRA REQUIRED DRIVER.



MODULATOR SPEAKER ARRAY RETROFIT WIRING FOR ULTRAVOICE CONTROLLERS
MOD-UV-KIT (RETROFIT KIT)

ACTIVE MODULE	DRIVER-TERMINAL	WIRE COLOR
1 CUT RED & WHT/RED	A - 1 / A - 2	BROWN /WHT(JUMP)
	B - 1 / B - 2	WHT(JUMP)/WHT/BRN
	C - 1 / C - 2	WHT(JUMP)/ WHT/BRN
	D - 1 / D - 2	BROWN /WHT(JUMP)
2 CUT YEL & WHT/YEL	E - 1 / E - 2	ORG/WHT(JUMP)
	F - 1 / F - 2	WHT(JUMP)/WHT/ORG
	G - 1 / G - 2	WHT(JUMP)/ WHT/ORG
	H - 1 / H - 2	ORG/WHT(JUMP)
3 CUT BLU & WHT/BLU	I - 1 / I - 2	GRN /WHT(JUMP)
	J - 1 / J - 2	WHT(JUMP)/ WHT/GRN
	K - 1 / K - 2	WHT(JUMP)/ WHT/GRN
	L - 1 / L - 2	GRN /WHT(JUMP)
4 CUT GRY & WHT/GRY	M - 1 / M - 2	VIO /WHT(JUMP)
	N - 1 / N - 2	WHT(JUMP)/ WHT/VIO
	O - 1 / O - 2	WHT(JUMP)/ WHT/VIO
	P - 1 / P - 2	VIO /WHT(JUMP)
5 CUT WHT & BLK/WHT	Q - 1 / Q - 2	TAN /WHT(JUMP)
	R - 1 / R - 2	WHT(JUMP)/ WHT/TAN
	S - 1 / S - 2	WHT(JUMP)/ WHT/TAN
	T - 1 / T - 2	TAN /WHT(JUMP)
6 CUT PINK & WHT/PINK	U - 1 / U - 2	BLK /WHT(JUMP)
	V - 1 / V - 2	WHT(JUMP)/ WHT/BLK
	W - 1 / W - 2	WHT(JUMP)/ WHT/BLK
	X - 1 / X - 2	BLK /WHT(JUMP)

NOTE: EACH ACTIVE MODULE REQUIRES TWO WHITE JUMPERS (#T300214-09-009)



TOP VIEW MODULE 1
DRIVER ORIENTATION

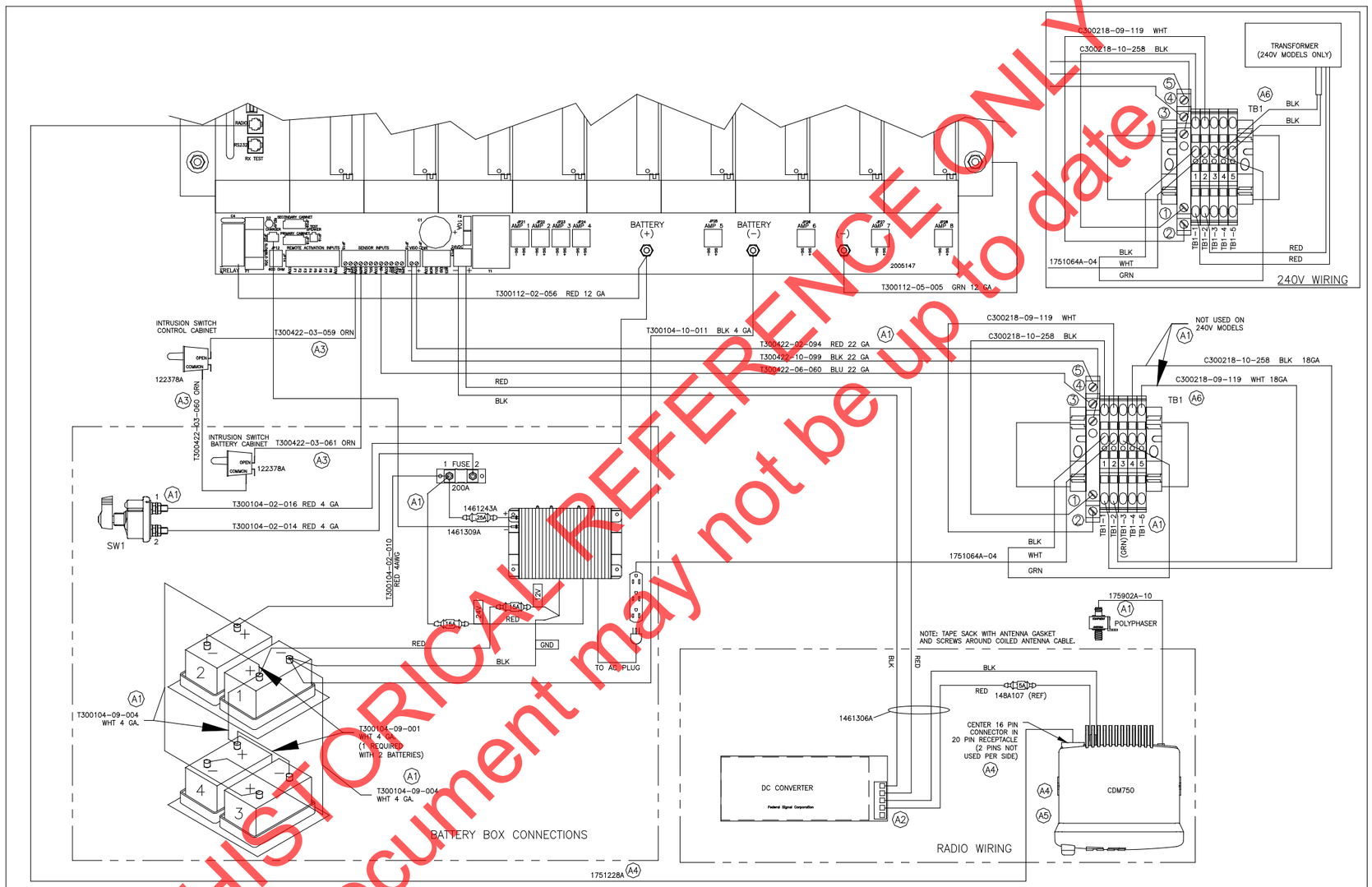
291283B

MODULATOR SPEAKER ARRAY RETROFIT WIRING FOR ULTRAVOICE CONTROLLERS (**WITHOUT** USING MOD-UV-KIT)

MODEL	WIRES EXTENDING FROM MODULATOR	
MOD1004	WHITE/BROWN	TO JP21-1 (MOTHERBOARD)
	BROWN	JUMPER
	WHITE/RED	
	RED	TO JP21-2 (MOTHERBOARD)
MOD2008	WHITE/ORANGE	TO JP22-1 (MOTHERBOARD)
	ORANGE	JUMPER
	WHITE/YELLOW	
	YELLOW	TO JP22-2 (MOTHERBOARD)
MOD3012	WHITE/GREEN	TO JP23-1 (MOTHERBOARD)
	GREEN	JUMPER
	WHITE/BLUE	
	BLUE	TO JP23-2 (MOTHERBOARD)
MOD4016	WHITE/VIOLET	TO JP24-1 (MOTHERBOARD)
	VIOLET	JUMPER
	WHITE/GRAY	
	GRAY	TO JP24-2 (MOTHERBOARD)
MOD5020	BLACK/WHITE	TO JP25-1 (MOTHERBOARD)
	WHITE	JUMPER
	WHITE/TAN	
	TAN	TO JP25-2 (MOTHERBOARD)
MOD6024	WHITE/BLACK	TO JP26-1 (MOTHERBOARD)
	BLACK	JUMPER
	WHITE/PINK	
	PINK	TO JP26-2 (MOTHERBOARD)

291324A

SECTION X APPENDIX B



NOTES:
1. BATTERY CONNECTIONS ARE MADE DURING SIREN INSTALLATION.
2. WHEN USING ONLY TWO BATTERIES, DO NOT USE (3) WHITE 4 AWG WIRES (T300104-09-004). (A1)
3. (A7) LENGTH OF WIRES IN BATTERY CABINET (MEASURED FROM CONDUIT END TO TERMINAL START ±0.5").
   T300422-03-060 & T300422-03-061, ORANGE, 36"
   T300104-02-016, RED, 13"
   T300104-10-011, BLACK, 10.5"
   1751064A-04, 10" TO END OF PLUG
   1461309A, 13.5"

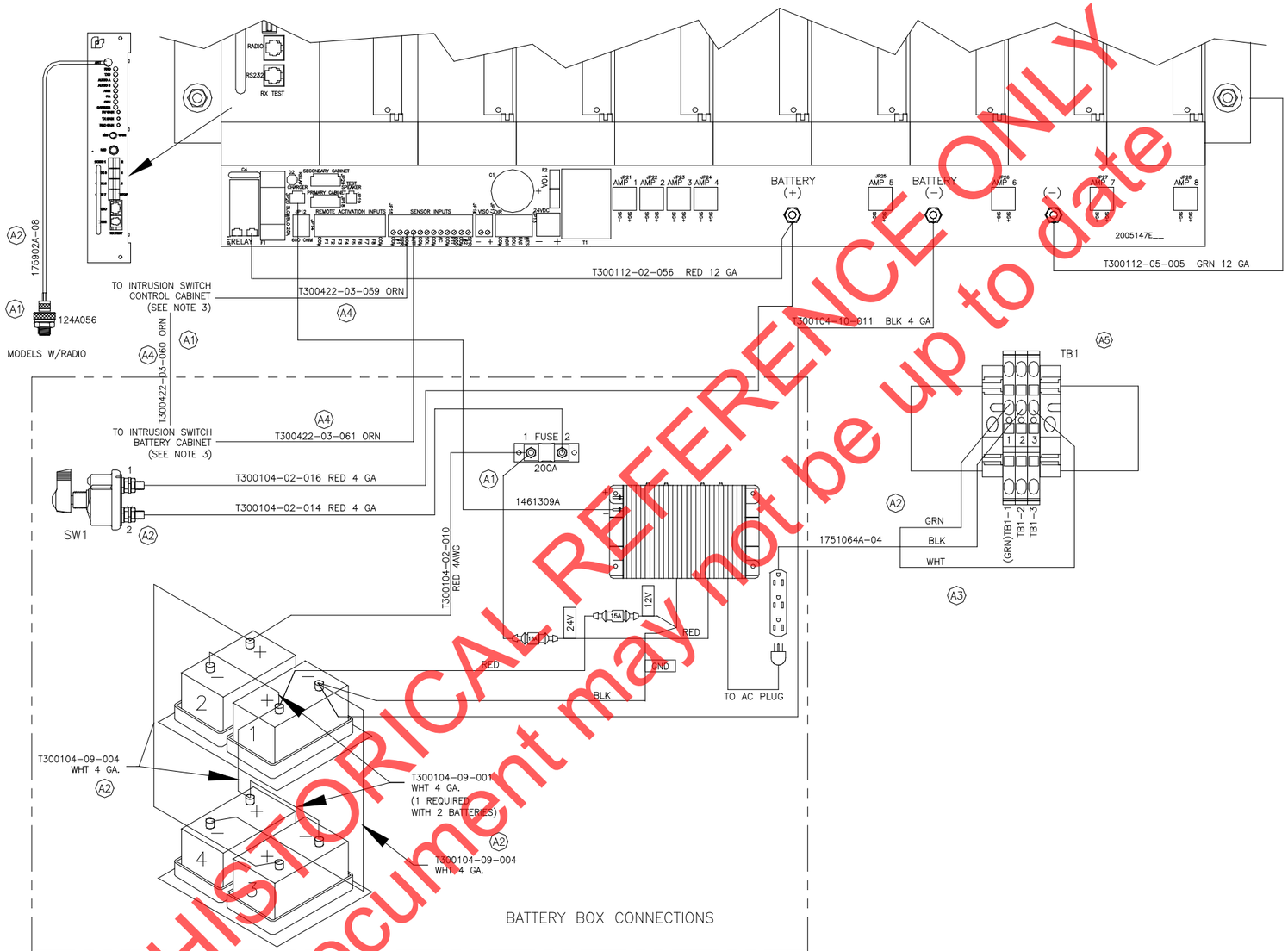
This drawing prepared in accordance with ANSI Y14.5M-1982

REV.	CHANGE	DATE	BY
A7	SEE ECO #07-4009	1/22/07	MAF
A6	SEE ECO #06-4141	10/30/06	MAF
A5	SEE ECO #05-4014	1/24/05	MAF
A4	SEE ECO #03-4105	9/12/03	MAF
A3	SEE ECO #02-4099	6/12/02	MAF
A2	SEE ECO #02-4079	5/2/02	MAF
A1	SEE ECO #01-4156	2/11/02	MAF
A	REL. TO PROD. ECO# 01-4137	10/3/01	MAF

FINISH: N/A
REMOVE BURRS, SHARP CORNERS AND EDGES
MATERIAL: N/A
UNIT OF MEASURE: RF
NAME: WIRING DIAGRAM 2-WAY,ULTRAVOICE

SIGNAL DIVISION
Federal Signal Corporation
2645 FEDERAL SIGNAL DRIVE – UNIVERSITY PARK, IL 60466

DRAWN BY MAF DATE 9/25/01
CHKD. BY MJF DATE 9/27/01
SCALE AT C SIZE: NONE DO NOT SCALE DRAWING
DRAWING NUMBER 259024A



NOTES:
1. BATTERY CONNECTIONS ARE MADE DURING SIREN INSTALLATION.
2. WHEN USING ONLY TWO BATTERIES, DO NOT USE (3) WHITE 4 AWG WIRES (T300104-09-004).
3. ORANGE INTRUSION SWITCH WIRES INCLUDED FOR POSSIBLE FUTURE USE.
4. LENGTH OF WIRE IN BATTERY CABINET (MEASURED FROM CONDUIT END TO TERMINAL START ±0.5")
   T300422-03-060 & T300422-03-061, ORANGE, 36"
   T300104-02-016, RED, 13"
   T300104-10-011, BLACK, 10.5"
   1751064A-04, 10" TO END OF PLUG
   1461309A, 13.5"

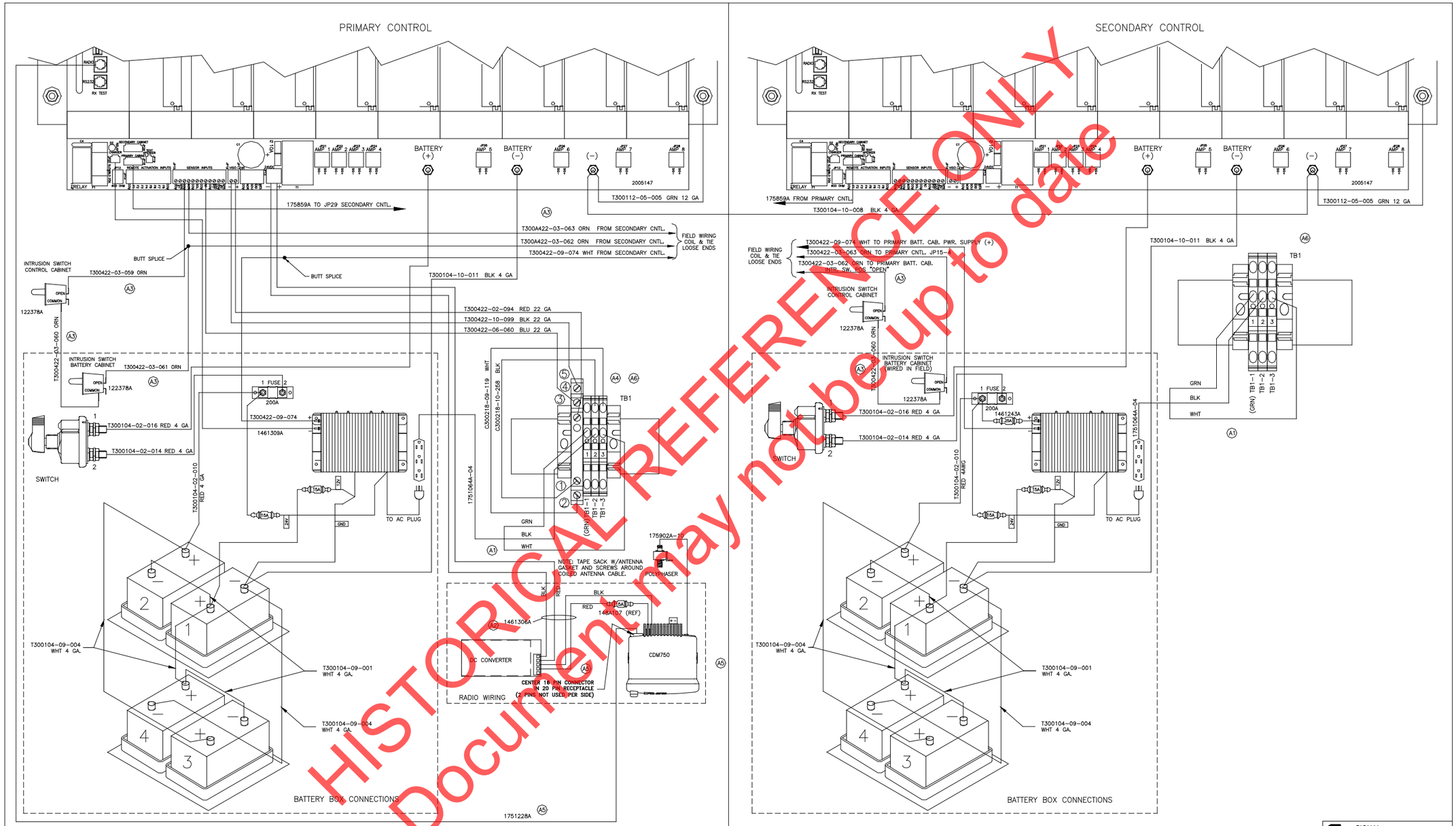
This drawing prepared in accordance with ANSI Y14.5M-1982

REV.	CHANGE	DATE	BY
A6	SEE ECO #07-4009	1/22/07	MAF
A5	SEE ECO #06-4141	10/30/06	MAF
A4	SEE ECO #02-4099	6/12/02	MAF
A3	SEE ECO #02-4079	5/2/02	MAF
A2	SEE ECO #01-4156	2/11/02	MAF
A1	SEE ECO #01-4150	10/24/01	MAF
A	REL. TO PROD. ECO# 01-4137	10/3/01	MAF

FINISH: N/A
REMOVE BURRS, SHARP CORNERS AND EDGES
MATERIAL: N/A
UNIT OF MEASURE: RF
NAME: WIRING DIAGRAM 1-WAY,ULTRAVOICE

SIGNAL DIVISION
Federal Signal Corporation
2645 FEDERAL SIGNAL DRIVE - UNIVERSITY PARK, IL 60466

DRAWN BY MAF DATE 10/1/01 | CHKD. BY SC DATE 10/3/01 | SCALE AT C SIZE: NONE DO NOT SCALE DRAWING
DRAWING NUMBER 259025A

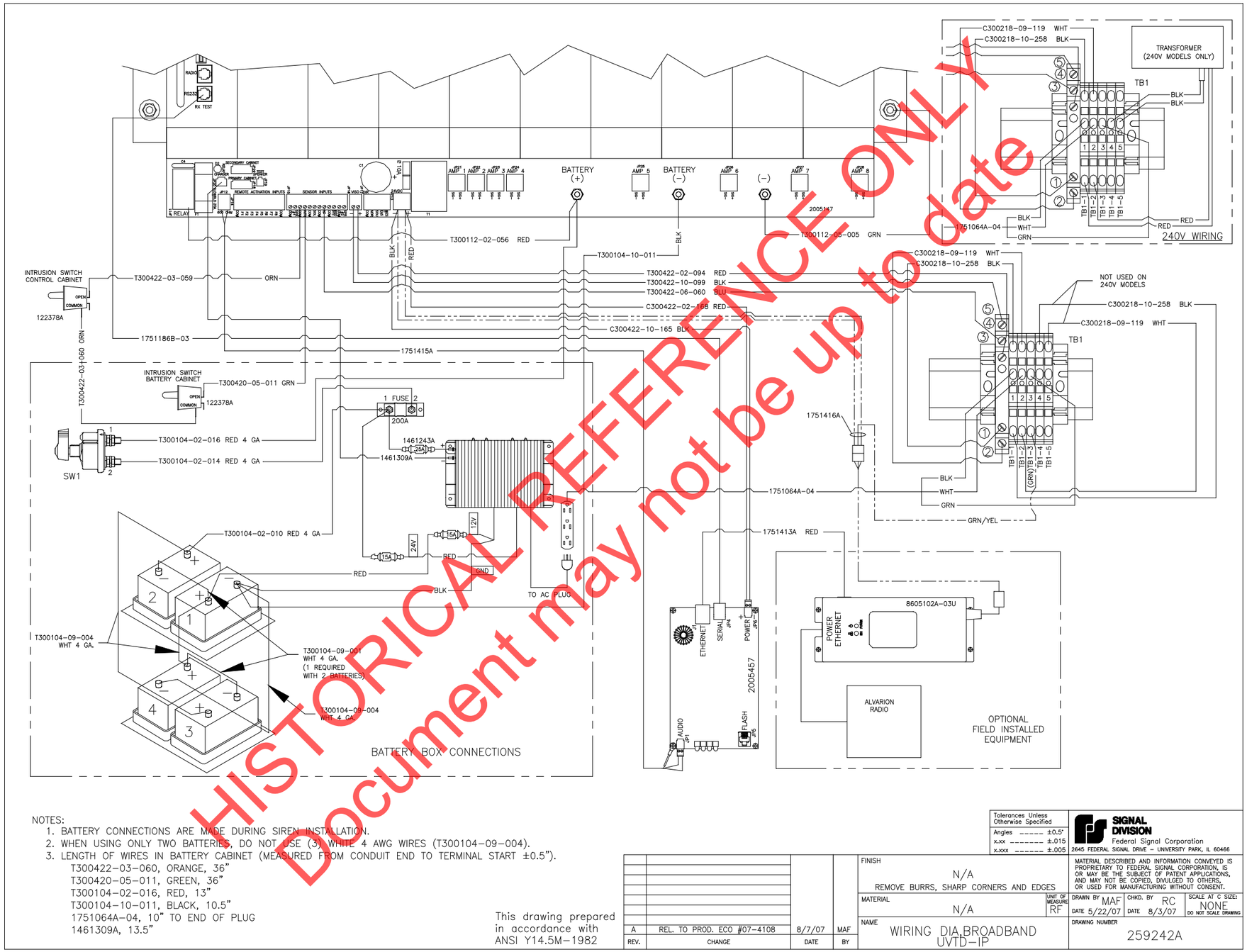


NOTE:
1. BATTERY CONNECTIONS ARE MADE DURING SIREN INSTALLATION.
2. (A7) LENGTH OF WIRES IN BATTERY CABINET (MEASURED FROM CONDUIT END TO TERMINAL START ±0.5").
   T300422-03-060 & T300422-03-061, ORANGE, 36"
   T300104-02-016, RED, 13"
   T300104-10-011, BLACK, 10.5"
   T300422-09-074, WHITE, 13.5"
   1751064A-04, 10" TO END OF PLUG
   1461309A, 13.5"

REV.	CHANGE	DATE	BY
A7	SEE ECO #07-4009	1/22/07	MAF
A6	SEE ECO #06-4141	10/30/06	MAF
A5	SEE ECO #03-4105	9/12/03	MAF
A4	SEE ECO #02-4160	10/8/02	MAF
A3	SEE ECO #02-4099	6/12/02	MAF
A2	SEE ECO #02-4079	5/2/02	MAF
A1	SEE ECO #02-4057	4/4/02	MAF
A	REL. TO PROD. ECO #01-4156	2/11/02	MAF

SIGNAL DIVISION
Federal Signal Corporation
2645 FEDERAL SIGNAL DRIVE – UNIVERSITY PARK, IL 60466

FINISH: N/A
REMOVE BURRS, SHARP CORNERS AND EDGES
MATERIAL: N/A
UNIT OF MEASURE: FT
NAME: WIRING DIAGRAM UVT6048
DRAWN BY: MAF DATE 11/6/01
CHKD. BY: MJF DATE 11/12/01
SCALE AT D SIZE: NONE DO NOT SCALE DRAWING
DRAWING NUMBER: 259027A



NOTES:
1. BATTERY CONNECTIONS ARE MADE DURING SIREN INSTALLATION.
2. WHEN USING ONLY TWO BATTERIES, DO NOT USE (3) WHITE 4 AWG WIRES (T300104-09-004).
3. LENGTH OF WIRES IN BATTERY CABINET (MEASURED FROM CONDUIT END TO TERMINAL START ±0.5").
   T300422-03-060, ORANGE, 36"
   T300420-05-011, GREEN, 36"
   T300104-02-016, RED, 13"
   T300104-10-011, BLACK, 10.5"
   1751064A-04, 10" TO END OF PLUG
   1461309A, 13.5"

This drawing prepared in accordance with ANSI Y14.5M-1982

REV.	CHANGE	DATE	BY
A	REL. TO PROD. ECO #07-4108	8/7/07	MAF

Tolerances Unless Otherwise Specified
Angles ±0.5°
x.xx ±.015
x.xxx ±.005

SIGNAL DIVISION
Federal Signal Corporation
2645 FEDERAL SIGNAL DRIVE – UNIVERSITY PARK, IL 60466

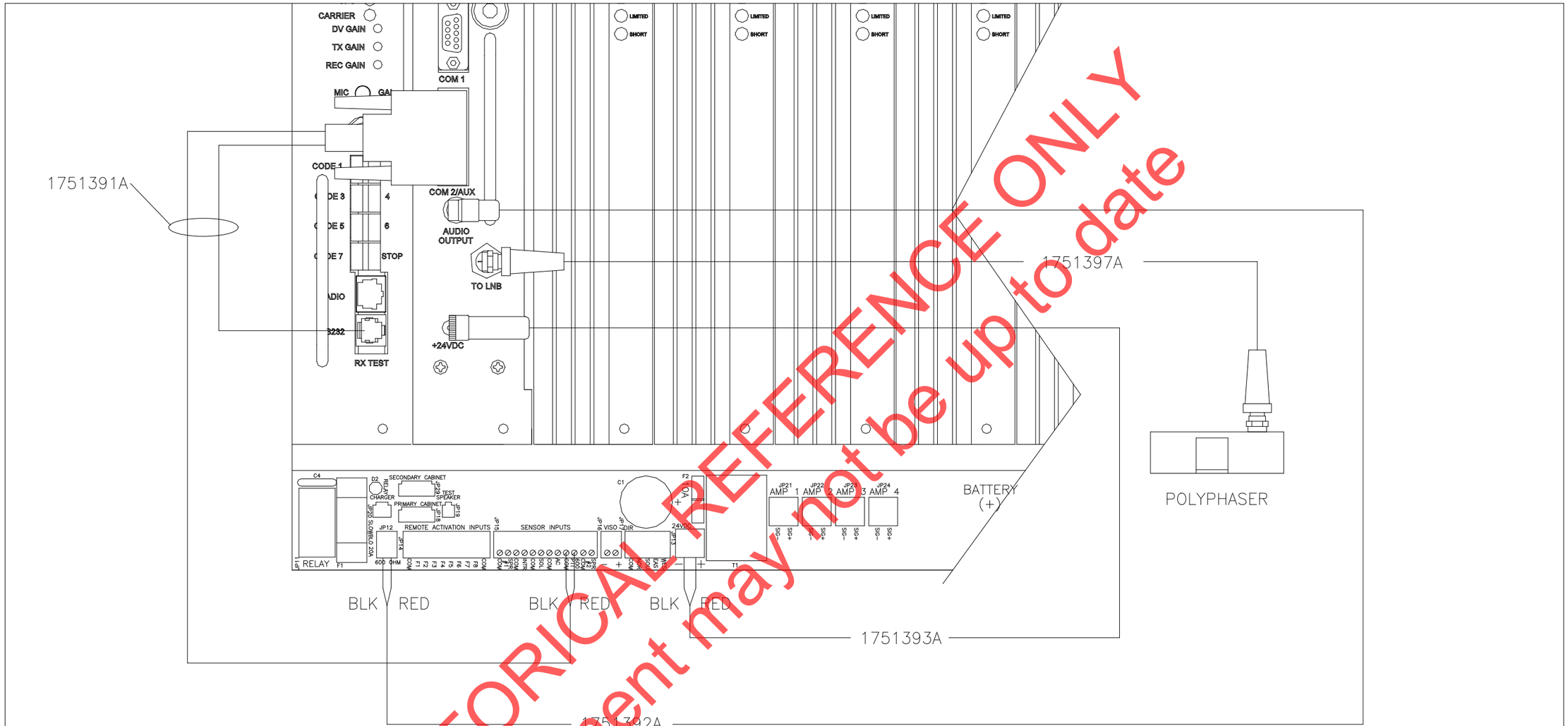
FINISH: N/A
REMOVE BURRS, SHARP CORNERS AND EDGES

MATERIAL: N/A
UNIT OF MEASURE: RF

NAME: WIRING DIA,BROADBAND UVTD-IP

DRAWN BY MAF DATE 5/22/07
CHKD. BY RC DATE 8/3/07
SCALE AT C SIZE: NONE DO NOT SCALE DRAWING

DRAWING NUMBER: 259242A



SIGNAL DIVISION
Federal Signal Corporation
2645 FEDERAL SIGNAL DRIVE – UNIVERSITY PARK, IL 60466

REV.	CHANGE	DATE	BY
A	REL TO PROD. ECO #06-4136	10/16/06	MAF

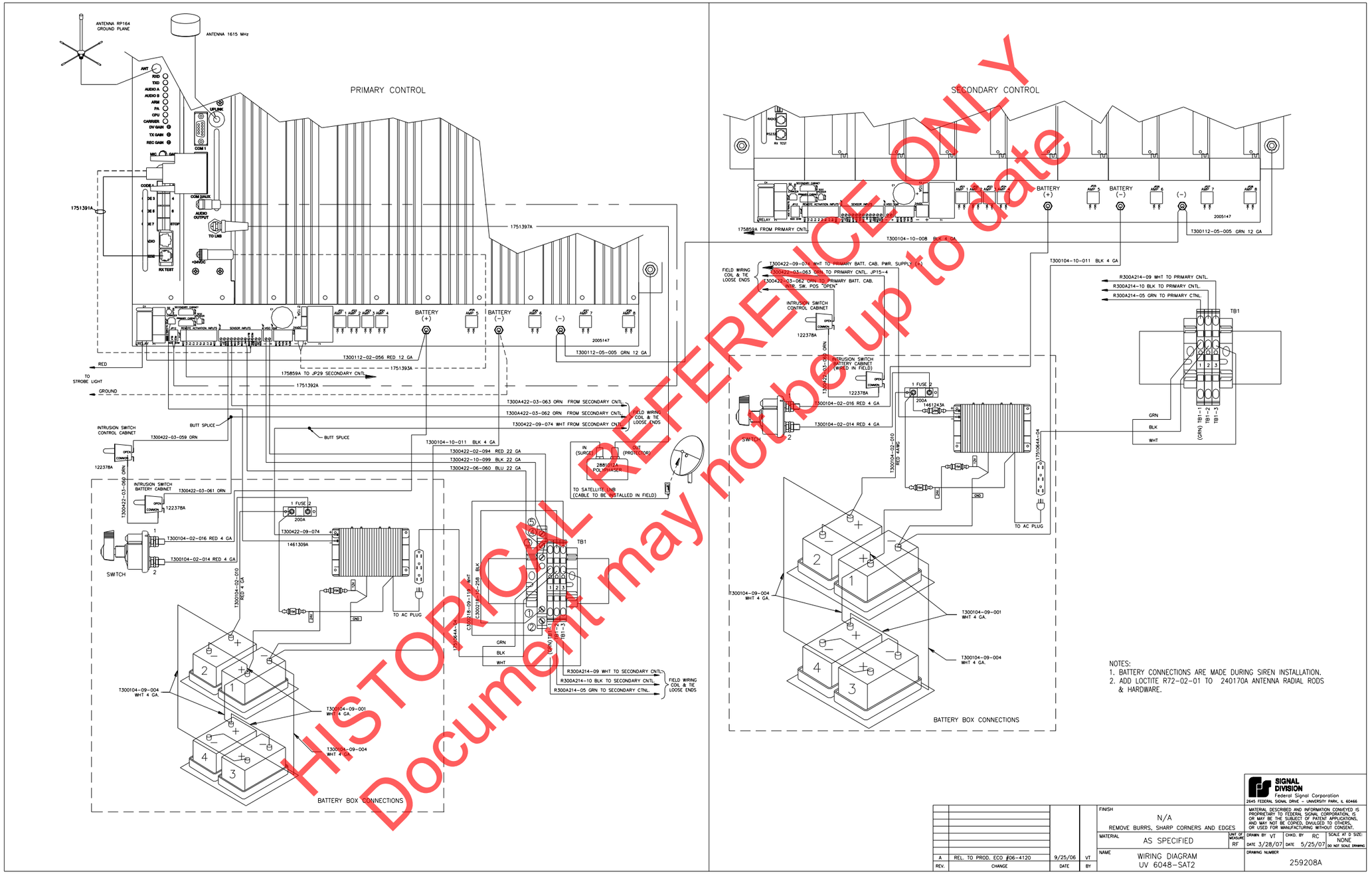
FINISH: N/A
REMOVE BURRS, SHARP CORNERS AND EDGES

MATERIAL: N/A — UNIT OF MEASURE: RF

NAME: WIRING DIA, SATELLITE MODULE IN UV

DRAWN BY: MAF — DATE: 10/10/06
CHKD. BY: RC — DATE: 10/10/06
SCALE AT B SIZE: NONE — DO NOT SCALE DRAWING

DRAWING NUMBER: 259207A

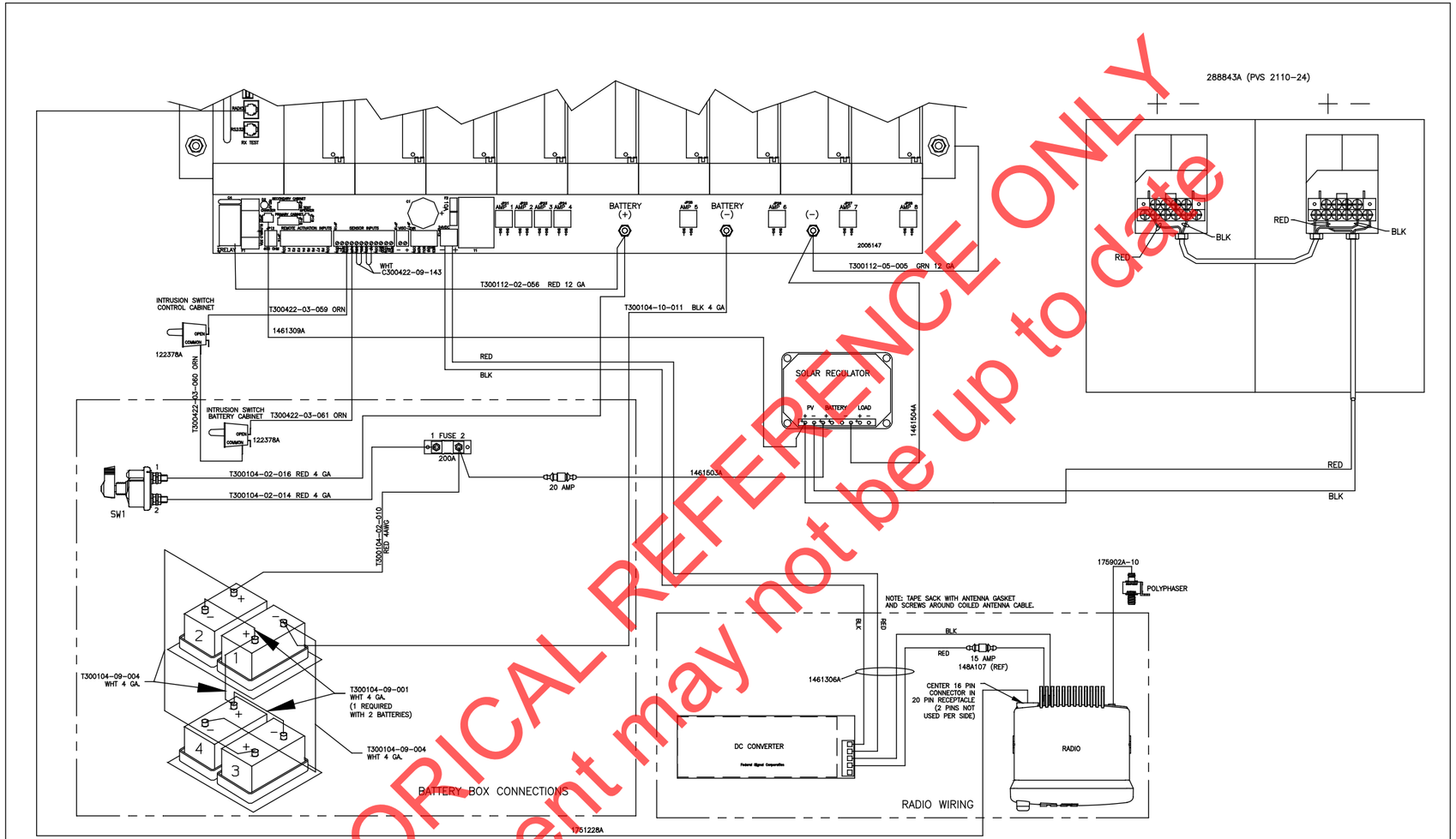


NOTES:
1. BATTERY CONNECTIONS ARE MADE DURING SIREN INSTALLATION.
2. ADD LOCTITE R72-02-01 TO 240170A ANTENNA RADIAL RODS & HARDWARE.

REV.	CHANGE	DATE	BY
A	REL. TO PROD. ECO #06-4120	9/25/06	VT

FINISH: N/A
REMOVE BURRS, SHARP CORNERS AND EDGES
MATERIAL: AS SPECIFIED
UNT OF MEASURE: RF
NAME: WIRING DIAGRAM UV 6048-SAT2
DRAWN BY: VT DATE 3/28/07
CHKD. BY: RC DATE 5/25/07
SCALE AT D SIZE: NONE
DO NOT SCALE DRAWING
DRAWING NUMBER: 259208A

SIGNAL DIVISION
Federal Signal Corporation
2645 FEDERAL SIGNAL DRIVE - UNIVERSITY PARK, IL 60466



NOTES:
1. BATTERY CONNECTIONS ARE MADE DURING SIREN INSTALLATION.
2. WHEN USING ONLY TWO BATTERIES, DO NOT USE (3) WHITE 4 AWG WIRES (T300104-09-004).

This drawing prepared in accordance with ANSI Y14.5M-1982

REV.	CHANGE	DATE	BY
B	REL TO PROD. ECO #05-4142	9/14/05	MAF

SIGNAL DIVISION
Federal Signal Corporation
2645 FEDERAL SIGNAL DRIVE - UNIVERSITY PARK, IL 60466

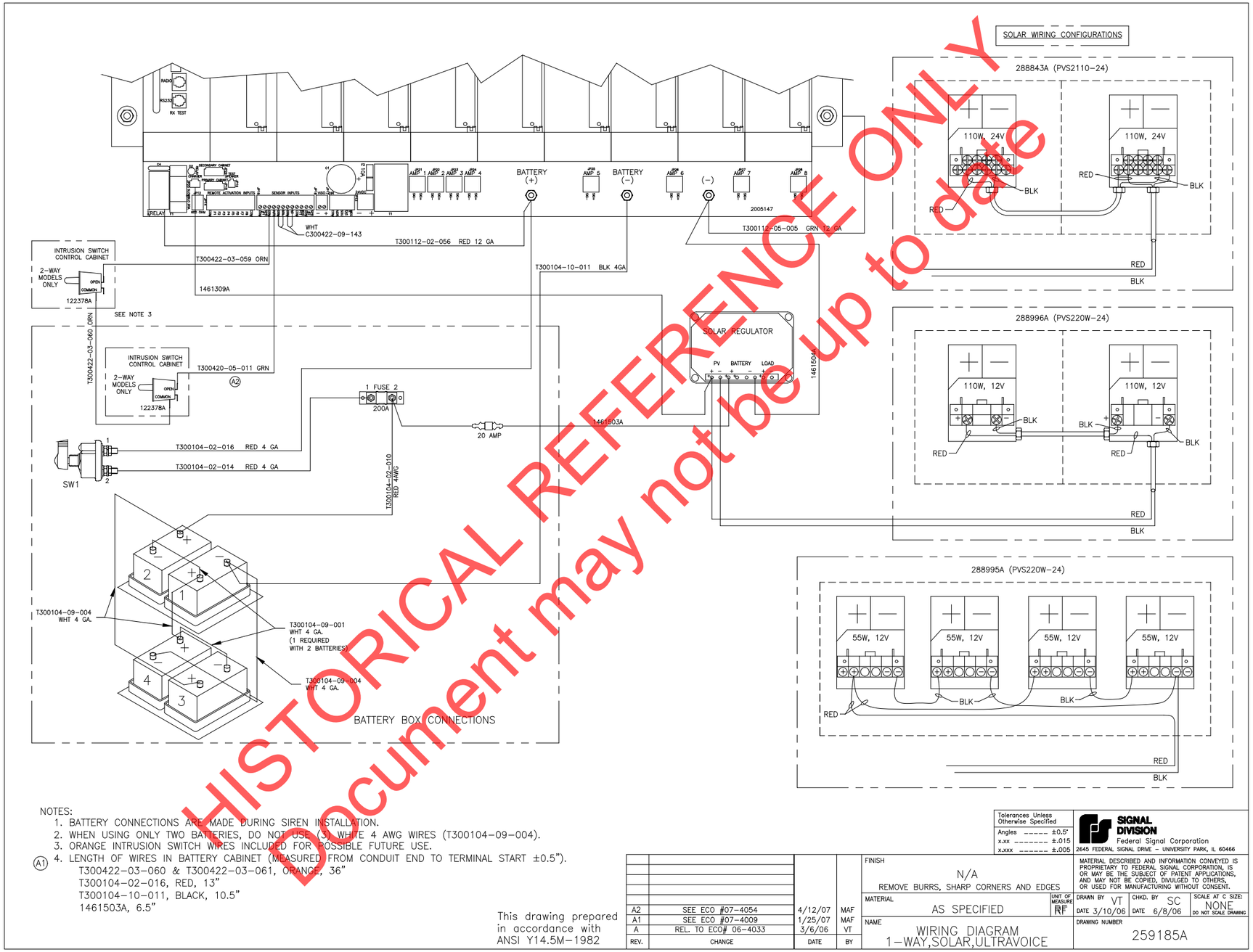
FINISH: N/A
REMOVE BURRS, SHARP CORNERS AND EDGES

MATERIAL: N/A
UNIT OF MEASURE: RF

NAME: WIRING DIAGRAM, 2-WAY,SOLAR,ULTRAVOICE

DRAWING NUMBER: 259072B

DRAWN BY DJN DATE 6/29/05 | CHKD. BY TE DATE 7/6/05 | SCALE AT C SIZE: NONE DO NOT SCALE DRAWING



NOTES:
1. BATTERY CONNECTIONS ARE MADE DURING SIREN INSTALLATION.
2. WHEN USING ONLY TWO BATTERIES, DO NOT USE (3) WHITE 4 AWG WIRES (T300104-09-004).
3. ORANGE INTRUSION SWITCH WIRES INCLUDED FOR POSSIBLE FUTURE USE.
(A1) 4. LENGTH OF WIRES IN BATTERY CABINET (MEASURED FROM CONDUIT END TO TERMINAL START ±0.5").
T300422-03-060 & T300422-03-061, ORANGE, 36"
T300104-02-016, RED, 13"
T300104-10-011, BLACK, 10.5"
1461503A, 6.5"

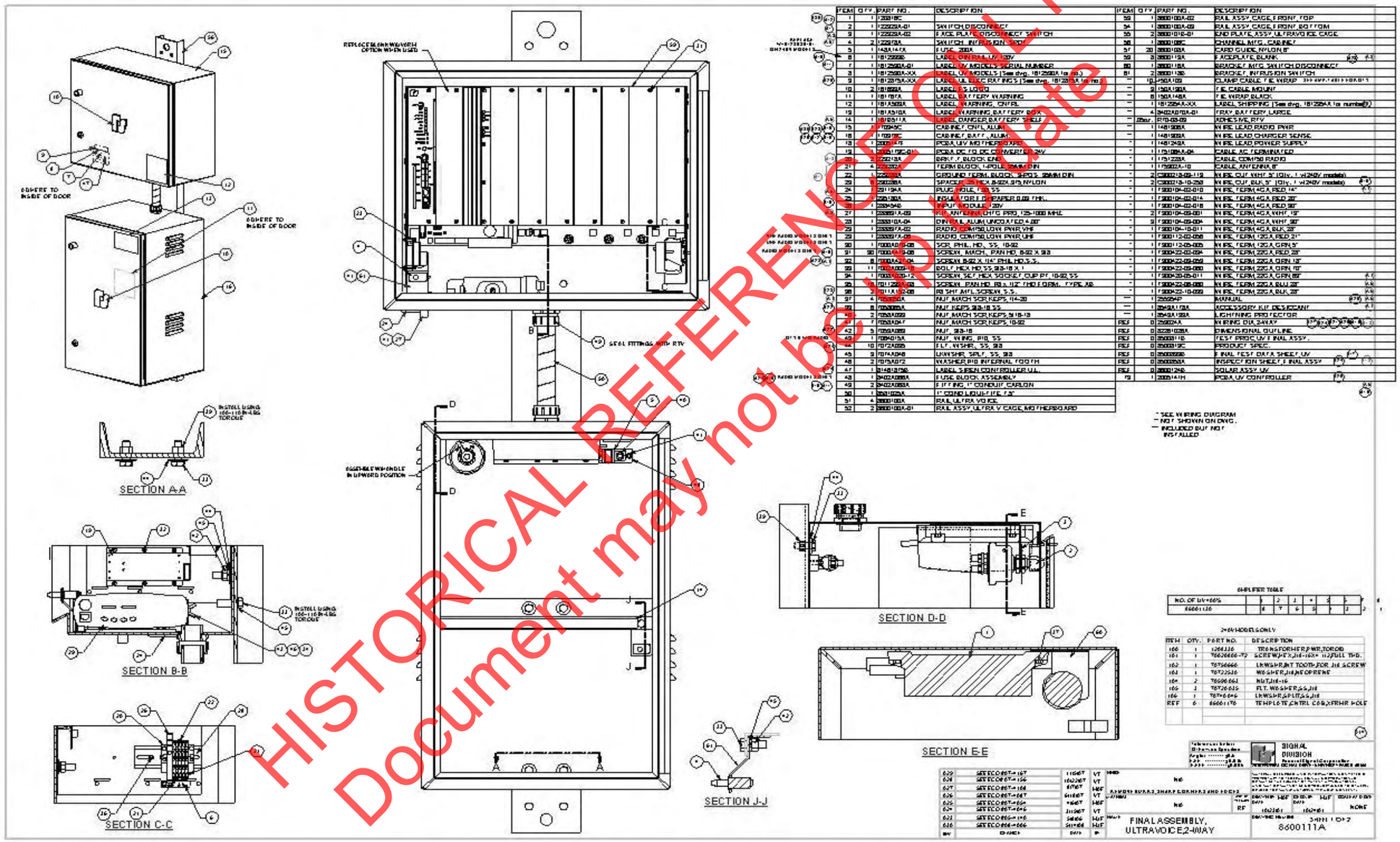
This drawing prepared in accordance with ANSI Y14.5M-1982

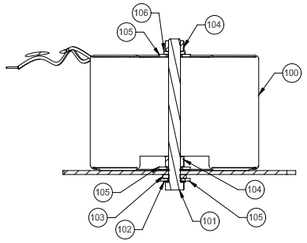
REV.	CHANGE	DATE	BY
A2	SEE ECO #07-4054	4/12/07	MAF
A1	SEE ECO #07-4009	1/25/07	MAF
A	REL. TO ECO# 06-4033	3/6/06	VT

FINISH: N/A
REMOVE BURRS, SHARP CORNERS AND EDGES
MATERIAL: AS SPECIFIED
UNIT OF MEASURE: IN
NAME: WIRING DIAGRAM 1-WAY,SOLAR,ULTRAVOICE
DRAWN BY VT DATE 3/10/06
CHKD. BY SC DATE 6/8/06
SCALE AT C SIZE: NONE DO NOT SCALE DRAWING
DRAWING NUMBER 259185A

Tolerances Unless Otherwise Specified
Angles ±0.5°
x.xx ±.015
x.xxx ±.005

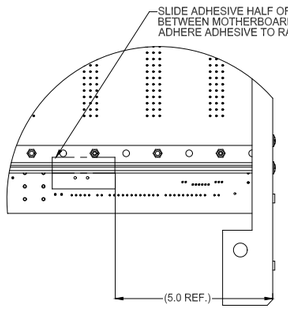
SIGNAL DIVISION
Federal Signal Corporation
2645 FEDERAL SIGNAL DRIVE – UNIVERSITY PARK, IL 60466



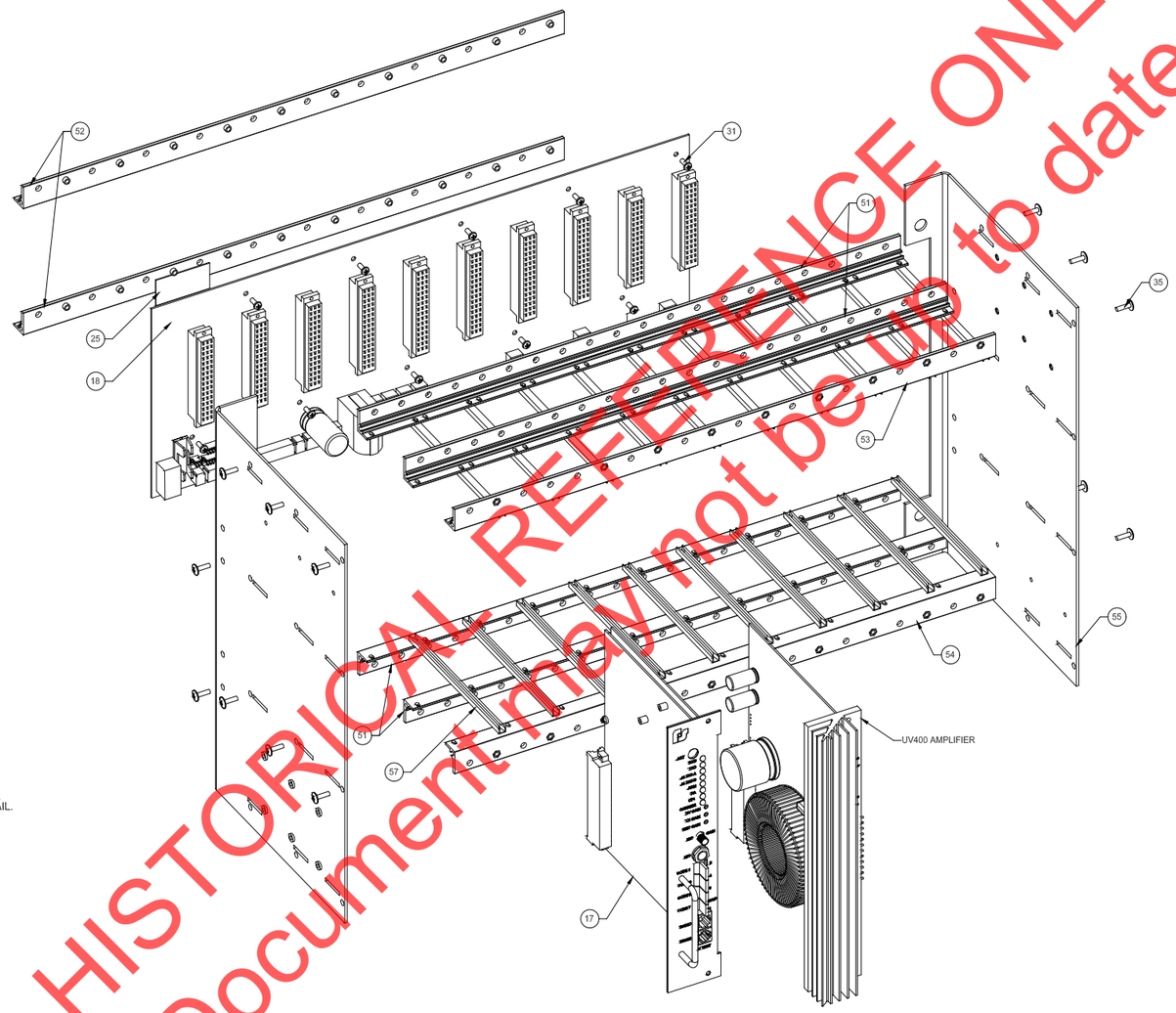


TRANSFORMER - 240V MODELS

ASSEMBLE TO CABINET PRIOR TO CAGE INSTALLATION

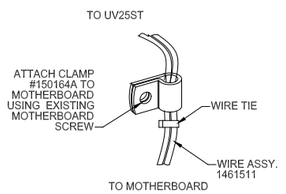


REAR VIEW OF CAGE ASSEMBLY

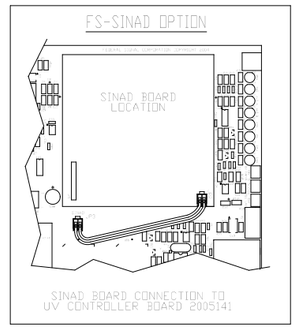


CAGE ASSEMBLY

UV25ST OPTION



WHEN USING UV25ST OPTION, AMPS ARE GROUPED TOGETHER WITH UV25ST'S GROUPED TO THE RIGHT OF THEM. CONNECT THE AMPLIFIER OUTPUT TO THE UV25ST USING THE 1461511A WIRE SET.



A13

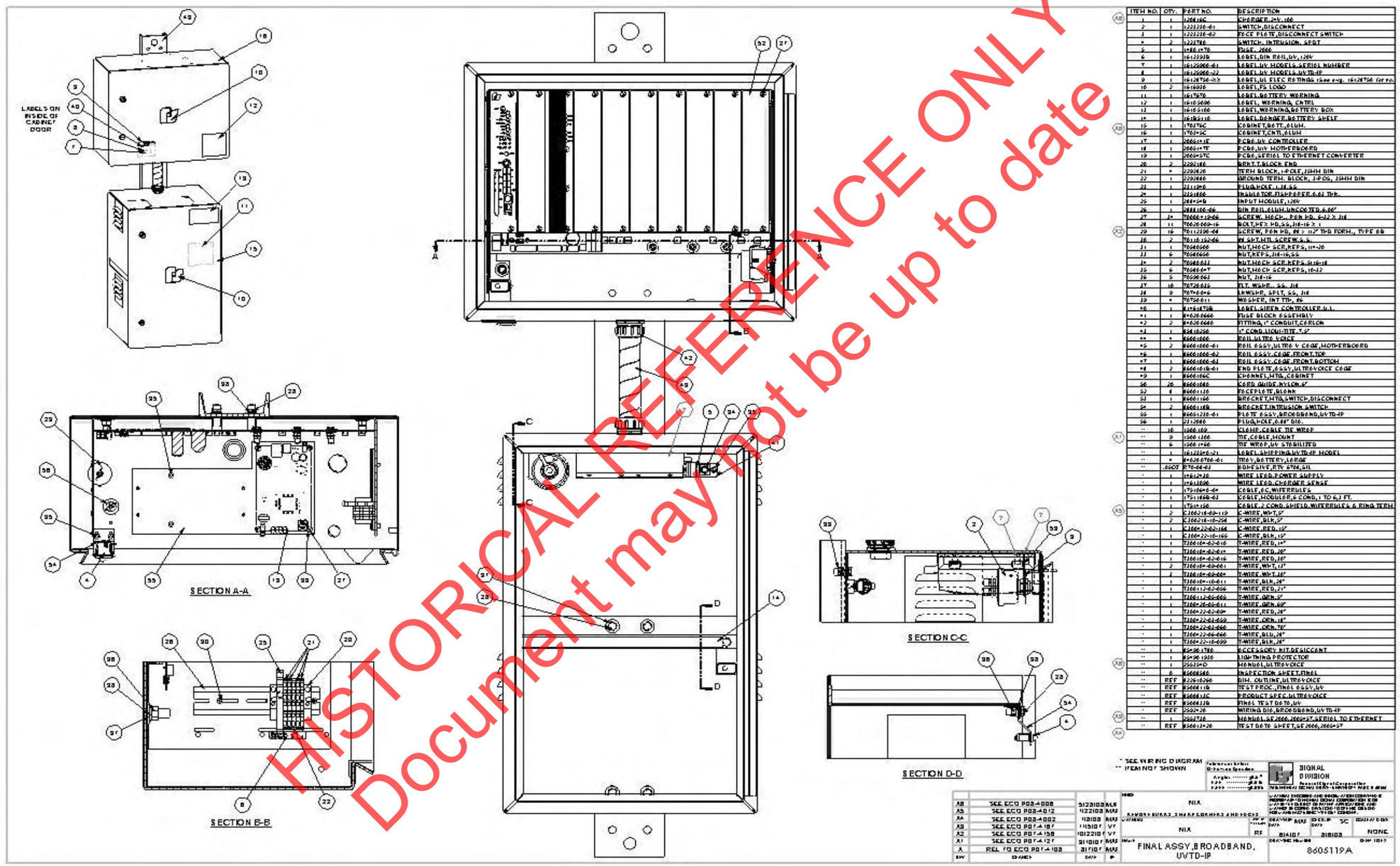
				FINISH: N/A	
				REMOVE BURRS, SHARP CORNERS AND EDGES	
				MATERIAL: N/A	UNIT OF MEASURE: RF
				NAME: FINAL ASSEMBLY, ULTRAVOICE,2-WAY	
A27	SEE SHEET 1	**/**/**	**		
REV	CHANGE	DATE	BY		

Tolerances Unless Otherwise Specified
Angles ------- ±0.5°
X.XX ------- ±0.015
X.XXX ------- ±0.005

SIGNAL DIVISION
Federal Signal Corporation
2645 FEDERAL SIGNAL DRIVE - UNIVERSITY PARK,IL 60466

DRAWN BY:	CHKD. BY:	SCALE AT D SIZE:
MAF	MJF	NONE
DATE: 10/23/01	DATE: 10/24/01	

DRAWING NUMBER: SHEET 2 OF 2
8600111A



ITEM NO.	QTY.	PART NO.	DESCRIPTION
	1	1268166	CHARGER,24V,16A
2	1	1222226-01	SWITCH,DISCONNECT
3	1	1222226-02	FACE PLATE,DISCONNECT SWITCH
*	2	1222766	SWITCH, INTRUSION, SPDT
5	1	1148.1*76	FUSE, 2AMP
6	1	16122938	LABEL,DIN RAIL,UV,120V
7	1	16125906-01	LABEL,UV MODELS,SERIAL NUMBER
8	1	16125906-22	LABEL,UV MODELS,UVTD-IP
9	1	16128756-XX	LABEL,UL FIRE RATINGS (see e.g. 16128756 for P.O.
10	2	16116010	LABEL,FS LOGO
11	1	16115676	LABEL,BATTERY WARNING
12	1	16115606	LABEL, WARNING, CNTRL
13	1	16115116	LABEL,WARNING,BATTERY BOX
14	1	16115116	LABEL,DANGER,BATTERY SHELF
15	1	1703756	CABINET,BATT.,ELUH.
16	1	1703*5C	CABINET,CNTL.ELUH
17	1	2666*1*1F	PCB6,UV CONTROLLER
18	1	2666*1*7F	PCB6,UV MOTHERBOARD
19	1	2666*57C	PCB6,SERIAL TO ETHERNET CONVERTER
20	2	2292186	BRKT,T-BLOCK END
21	*	2292826	TERM BLOCK,1-POLE,35MM DIN
22	1	2292886	GROUND TERM. BLOCK, 2-POS, 35MM DIN
23	1	2211296	PLUG,HOLE,1.18 SQ.
24	1	2252886	INSULATOR,FLASHPROOF,0.61 THK.
25	1	2684*518	INPUT MODULE,120V
26	1	2888166-66	DIN RAIL,ELUH,UNCOATED,6.66"
27	2*	76666*12-66	SCREW, MACH., PAN HD, 6-32 X 3/8
28	11	76636669-16	BOLT,HEX HD,SS,3/8-16 X 1
29	19	76112296-66	SCREW, PAN HD, #8 X 11/2" TYD FORM., TYPE 6B
30	2	76116122-66	#8 SHT.MTL.SCREW,S.S.
31	1	76666666	NUT,HEX SCR,REPS,11*-20
33	6	76666666	NUT,REPS,3/8-16,SS
34	2	76666111	NUT,HEX SCR,REPS,5/16-18
35	6	76666*7T	NUT,HEX SCR,REPS,1/4-20
36	5	76636663	NUT, 3/8-16
37	16	76726635	FLT. WSHR., SS, 3/8
38	9	7676636	LKWSHR, SPLT, SS, 3/8
39	*	76736611	WASHER, INT TTH, SS
*0	1	81*16*75B	LABEL,SIREN CONTROLLER,U.L.
*1	1	8626.6666	FUSE BLOCK ASSEMBLY
*2	2	8626.6666	FITTING,1" CONDUIT,CORLON
*3	1	864.16296	1" CONDUIT-NUT T.S."
**	*	86661666	REEL,ULTRA VOICE
*5	2	86661666-61	REEL ASSY,ULTRA V CODE,MOTHERBOARD
*6	1	86661666-62	REEL ASSY,CODE,FRONT,TOP
*7	1	86661666-63	REEL ASSY,CODE,FRONT,BOTTOM
*8	2	86661618-61	END PLATE,ASSY,ULTRAVOICE CODE
*9	1	86661166C	CHANNEL,MTG,CABINET
56	26	86661666	CORD,GUIDE,NYLON,6"
52	4	86661126	RECEPTACLE,BLANK
53	1	86661166	BRACKET,MTG,SWITCH,DISCONNECT
54	2	86661168	BRACKET,INTRUSION SWITCH
55	1	86651216-61	PLATE ASSY,BROADBAND,UVTD-IP
56	1	2711266	PLUG,HOLE,0.88" DIA.
**	16	1566169	CLAMP,CABLE TIE WRAP
**	9	1566.1366	TIE,CABLE,MOUNT
**	6	1566.1966	TIE WRAP,UV STABILITED
**	1	16122916-21	LABEL,SHIPPING,UVTD-IP MODEL
**	*	8626.6766-61	TRAY,BATTERY,LEAD
**	.6603	876-66-63	ADHESIVE,RTV 6704,SIL
*	1	1561*.16	WIRE LEAD,POWER SUPPLY
*	1	1561.1696	WIRE LEAD,CHARGER SENSE
*	1	175.1664-64	CABLE,6C,WIFERRULES
*	1	175.1668-63	CABLE,MODULER,6 COND.,1 TO 6,3 FT.
*	1	175.1*.16	CABLE,2 COND.SHIELD,WIFERRULES & RING TERM
*	2	C1662.16-1.119	C-WIRE,WHT,9"
*	2	C1662.16-16.268	C-WIRE,BLK,9"
*	1	C1664.22-62.164	C-WIRE,RED,12"
*	1	C1664.22-16.166	C-WIRE,BLK,12"
*	1	T1661.64-62.616	T-WIRE,RED,14"
*	1	T1661.64-62.616	T-WIRE,RED,20"
*	1	T1661.64-62.616	T-WIRE,RED,30"
*	2	T1661.64-66.661	T-WIRE,WHT,13"
*	1	T1661.64-66.666	T-WIRE,WHT,30"
*	1	T1661.64-16.611	T-WIRE,BLK,28"
*	1	T1661.12-62.666	T-WIRE,RED,21"
*	1	T1661.12-66.666	T-WIRE,GRN,9"
*	1	T1661.26-66.611	T-WIRE,GRN,62"
*	1	T1661.22-62.64*	T-WIRE,RED,28"
*	1	T1661.22-61.666	T-WIRE,GRN,18"
*	1	T1661.22-61.666	T-WIRE,GRN,76"
*	1	T1661.22-66.666	T-WIRE,BLU,28"
*	1	T1661.22-16.699	T-WIRE,BLK,28"
*	1	864.96.1786	ACCESSORY KIT,DESICCANT
*	1	864.96.1916	LIGHTNING PROTECTOR
**	1	2551.5*0	MANUAL,ULTRAVOICE
**	6	86666666	INSPECTION SHEET,FINAL
**	REF	8626.6266	DIM. OUTLINE,ULTRAVOICE
**	REF	86666116	TEST PROC.,FINAL ASSY,UV
**	REF	86666116	PRODUCT SPEC,ULTRAVOICE
**	REF	86666116	FINAL TEST DATA,UV
**	REF	2592.26	WIRING DIG,BROADBAND,UVTD-IP
**	1	2561.716	MANUAL,SE2666,2666ST,SERIAL TO ETHERNET
**	REF	86661.*.26	TEST DATA SHEET,SE2666,2666ST

* SEE WIRING DIAGRAM
** ITEM NOT SHOWN

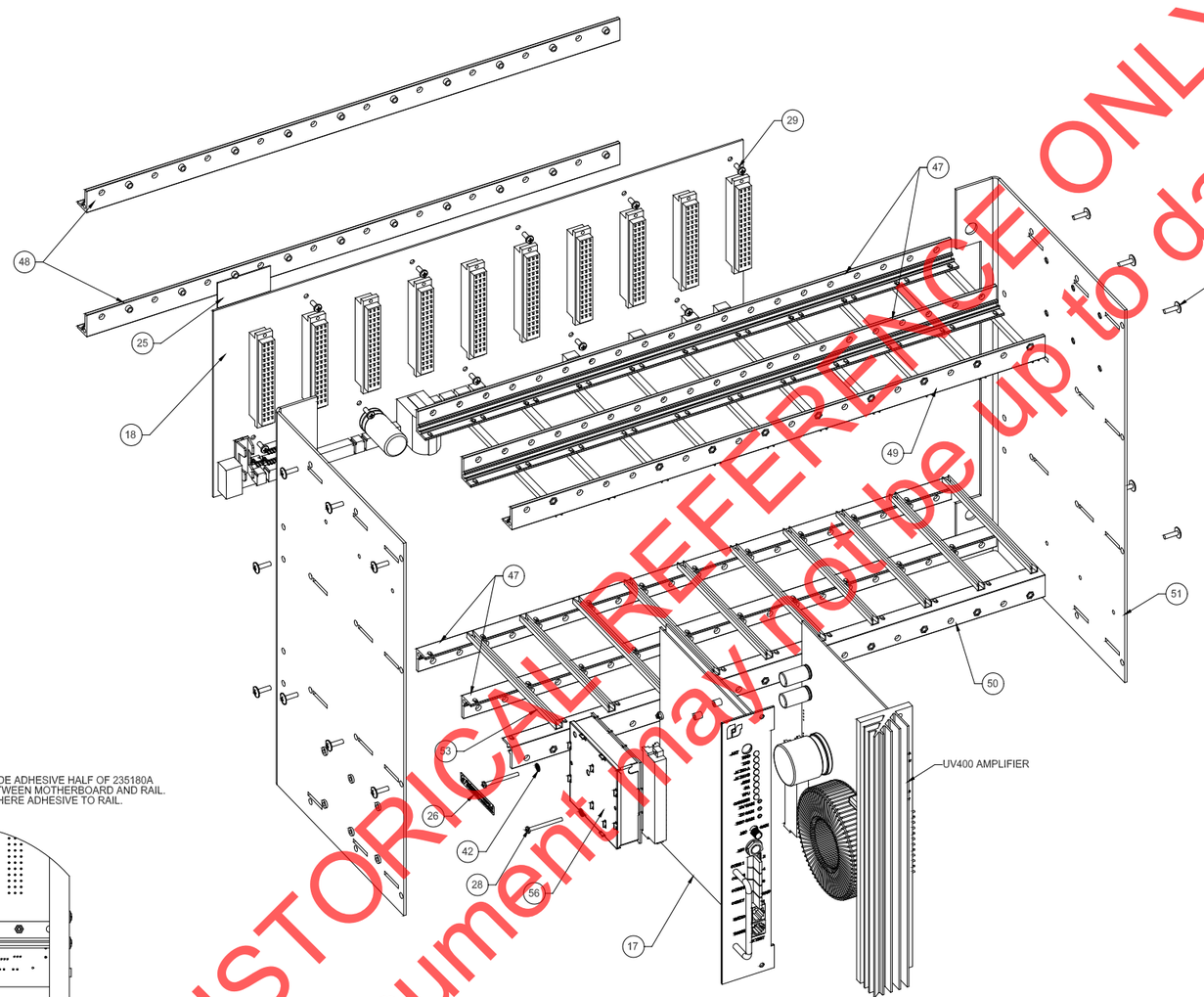
REV	DESCRIPTION	DATE	BY
A8	SEE ECO P03-4008	5/23/03	MAE
A9	SEE ECO P03-4012	7/22/03	MAE
AA	SEE ECO P03-4032	11/3/03	MAE
AB	SEE ECO P04-4187	1/15/07	VF
A2	SEE ECO P07-4158	10/22/10	VF
A1	SEE ECO P07-4121	5/10/07	MAE
A	REL TO ECO P07-4103	3/7/07	MAE

DRAWN	NIA
CHECKED	NIA
APPROVED	
MFG APPR	
ENG APPR	
MATERIAL	
FINISH	
NEXT ASSY	
USED ON	
APPLICATION	
DO NOT SCALE DRAWING	

FINAL ASSY,BROADBAND, UVTD-IP

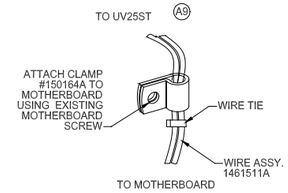
SIGNAL DIVISION

8605119A

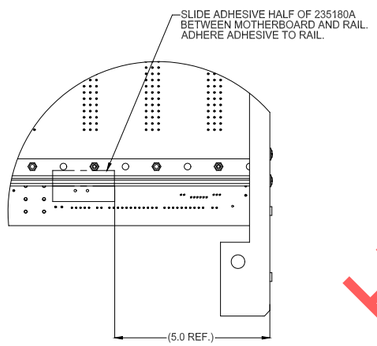


CAGE ASSY.

UV25ST OPTION

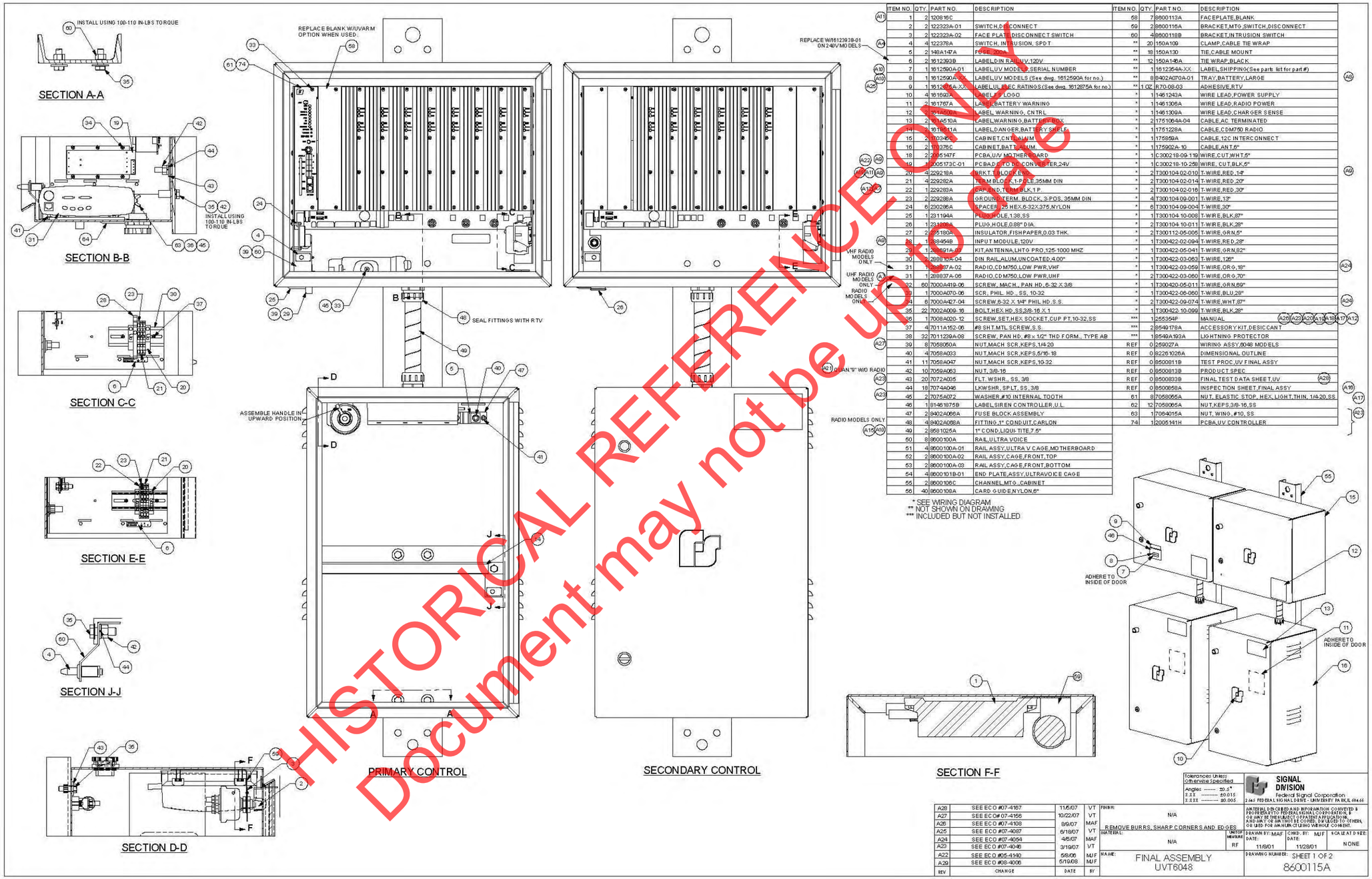


WHEN USING UV25ST OPTION, AMPS ARE GROUPED TOGETHER WITH UV25ST'S GROUPED TO THE RIGHT OF THEM. CONNECT THE AMPLIFIER OUTPUT TO THE UV25ST USING THE 1461511A WIRE SET.



REAR VIEW OF CAGE ASSY.

A27	SEE SHEET 1	8/9/07	MAF	FINISH: N/A; REMOVE BURRS, SHARP CORNERS AND EDGES	Tolerances Unless Otherwise Specified: Angles ±0.5°, X.XX ±0.015, X.XXX ±0.005
REV	CHANGE	DATE	BY	MATERIAL: N/A; UNIT OF MEASURE: RF	SIGNAL DIVISION, Federal Signal Corporation, 2645 FEDERAL SIGNAL DRIVE - UNIVERSITY PARK,IL 60466
				NAME: FINAL ASSEMBLY, ULTRAVOICE,ONE-WAY	DRAWN BY: MAF; DATE: 10/12/01; CHKD. BY: MJF; DATE: 10/24/01; SCALE AT D SIZE: NONE; DRAWING NUMBER: 8600109A; SHEET 2 OF 2



ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	2	120816C	
2	2	122323A-01	SWITCH,DISCONNECT
3	2	122323A-02	FACE PLATE,DISCONNECT SWITCH
4	4	122378A	SWITCH, INTRUSION, SPDT
5	2	148A147A	FUSE,3AG
6	2	1612393B	LABEL,DIN RAIL,UV,120V
7	1	1612590A-01	LABEL,UV MODELS,SERIAL NUMBER
8	1	1612590A-XX	LABEL,UV MODELS (See dwg. 1612590A for no.)
9	1	1612875A-XX	LABEL,UL/FM,CE RATINGS (See dwg. 1612875A for no.)
10	4	161693A	LABEL,F.S.LOGO
11	2	161767A	LABEL,BATTERY WARNING
12	1	161A509A	LABEL,WARNING,CNTRL
13	2	161A510A	LABEL,WARNING,BATTERY BOX
14	2	161E511A	LABEL,DANGER,BATTERY SHELF
15	2	170340C	CABINET,CNTL,ALUM
16	2	170376C	CABINET,BATT,ALUM
17	2	2295147F	PCBA,UV MOTHERBOARD
18	1	2005173C-01	PCBA,DC TO DC CONVERTER,24V
19	4	229218A	BRKT,TERMINAL BLOCK,END
20	4	229282A	TERM BLOCK,1-POLE,35MM DIN
21	1	229283A	CAP,END,TERM BLK,1 P.
22	2	229288A	GROUND TERM. BLOCK, 3-POS, 35MM DIN
23	6	230286A	SPACER,.25 HEX,6-32X.375,NYLON
24	1	231194A	PLUG,HOLE,1.38,SS
25	1	231209A	PLUG,HOLE,0.88" DIA.
26	2	235180A	INSULATOR,FISHPAPER,0.03 THK.
27	1	238454B	INPUT MODULE,120V
28	1	238691A-02	KIT,ANTENNA,LHTG PRO,125-1000 MHZ
29	1	288810A-04	DIN RAIL,ALUM,UNCOATED,4.00"
30	1	289837A-02	RADIO,CDM750,LOW PWR,VHF
31	1	289837A-06	RADIO,CDM750,LOW PWR,UHF
32	60	7000A419-06	SCREW, MACH., PAN HD., 6-32 X 3/8
33	1	7000A070-06	SCR, PHIL HD., SS, 10-32
34	6	7000A427-04	SCREW,6-32 X 1/4" PHIL HD.,S.S.
35	22	7002A009-16	BOLT,HEX HD,SS,3/8-16 X 1
36	1	7008A020-12	SCREW,SET,HEX SOCKET,CUP PT,10-32,SS
37	4	7011A152-06	#8 SHT.MTL SCREW,S.S.
38	32	7011239A-08	SCREW, PAN HD, #8 x 1/2" THD FORM,, TYPE AB
39	8	7058060A	NUT,MACH SCR,KEPS,1/4-20
40	4	7058A033	NUT,MACH SCR,KEPS,5/16-18
41	11	7058A047	NUT,MACH SCR,KEPS,10-32
42	10	7059A063	NUT, 3/8-16
43	20	7072A005	FLT. WSHR., SS, 3/8
44	18	7074A046	LKWSHR,SPLT,SS,3/8
45	2	7075A072	WASHER,#10 INTERNAL TOOTH
46	1	81461875B	LABEL,SIREN CONTROLLER,U.L.
47	2	8402A066A	FUSE BLOCK ASSEMBLY
48	4	8402A068A	FITTING,1" CONDUIT,CARLON
49	2	8581025A	1" COND,LIQUI-TITE,7.5"
50	8	8600100A	RAIL,ULTRA VOICE
51	4	8600100A-01	RAIL ASSY,ULTRA V CAGE,MOTHERBOARD
52	2	8600100A-02	RAIL ASSY,CAGE,FRONT,TOP
53	2	8600100A-03	RAIL ASSY,CAGE,FRONT,BOTTOM
54	4	8600101B-01	END PLATE,ASSY,ULTRAVOICE CAGE
55	2	8600106C	CHANNEL,MTG.,CABINET
56	40	8600109A	CARD GUIDE,NYLON,6"
58	1	8600113A	FACEPLATE,BLANK
59	2	8600116A	BRACKET,MTG,SWITCH,DISCONNECT
60	4	8600118B	BRACKET,INTRUSION SWITCH
61	20	150A109	CLAMP,CABLE TIE WRAP
62	12	150A130	TIE,CABLE MOUNT
63	12	150A146A	TIE WRAP,BLACK
64	1	1612354A-XX	LABEL,SHIPPING(See parts list for part #)
65	1	8402A070A-01	TRAY,BATTERY,LARGE
66	1 OZ	R70-08-03	ADHESIVE,RTV
67	1	1461243A	WIRE LEAD,POWER SUPPLY
68	1	1461306A	WIRE LEAD,RADIO POWER
69	1	1461309A	WIRE LEAD,CHARGER SENSE
70	2	1751064A-04	CABLE,AC TERMINATED
71	1	1751228A	CABLE,CDM750 RADIO
72	1	175859A	CABLE,12C INTERCONNECT
73	1	175902A-10	CABLE,ANT,6"
74	1	C300218-09-119	WIRE,CUT,WHT,5"
75	1	C300218-10-259	WIRE, CUT,BLK,5"
76	2	T300104-02-010	T-WIRE,RED,14"
77	2	T300104-02-014	T-WIRE,RED,20"
78	2	T300104-02-016	T-WIRE,RED,30"
79	4	T300104-09-001	T-WIRE,13"
80	6	T300104-09-004	T-WIRE,30"
81	1	T300104-10-008	T-WIRE,BLK,87"
82	2	T300104-10-011	T-WIRE,BLK,28"
83	2	T300112-05-005	T-WIRE,ORN,5"
84	1	T300422-02-094	T-WIRE,RED,28"
85	1	T300422-05-041	T-WIRE,ORN,82"
86	1	T300422-03-063	T-WIRE,126"
87	1	T300422-03-059	T-WIRE,ORG,18"
88	2	T300422-03-060	T-WIRE,ORG,70"
89	1	T300420-05-011	T-WIRE,ORN,69"
90	1	T300422-06-060	T-WIRE,BLU,28"
91	2	T300422-09-074	T-WIRE,WHT,87"
92	1	T300422-10-099	T-WIRE,BLK,28"
93	1	255354P	MANUAL
94	2	8549178A	ACCESSORY KIT,DESICCANT
95	1	8549A193A	LIGHTNING PROTECTOR
96	0	259027A	WIRING ASSY,8048 MODELS
97	0	82261026A	DIMENSIONAL OUTLINE
98	0	8500811B	TEST PROC,UV FINAL ASSY
99	0	8500813B	PRODUCT SPEC
100	0	8500833B	FINAL TEST DATA SHEET,UV
101	0	8500858A	INSPECTION SHEET,FINAL ASSY
102	8	7058065A	NUT, ELASTIC STOP, HEX, LIGHT,THIN, 1/4-20, SS
103	12	7058065A	NUT,KEPS,3/8-16,SS
104	1	7064015A	NUT, WING, #10, SS
105	1	2005141H	PCBA,UV CONTROLLER

* SEE WIRING DIAGRAM
** NOT SHOWN ON DRAWING
*** INCLUDED BUT NOT INSTALLED

REV	CHANGE	DATE	BY
A28	SEE ECO #07-4167	11/5/07	VT
A27	SEE ECO# 07-4156	10/22/07	VT
A26	SEE ECO #07-4108	8/9/07	MAF
A25	SEE ECO #07-4087	6/18/07	VT
A24	SEE ECO #07-4054	4/6/07	MAF
A23	SEE ECO #07-4046	3/19/07	VT
A22	SEE ECO #05-4140	5/8/06	MJF
A29	SEE ECO #08-4006	5/19/08	MJF

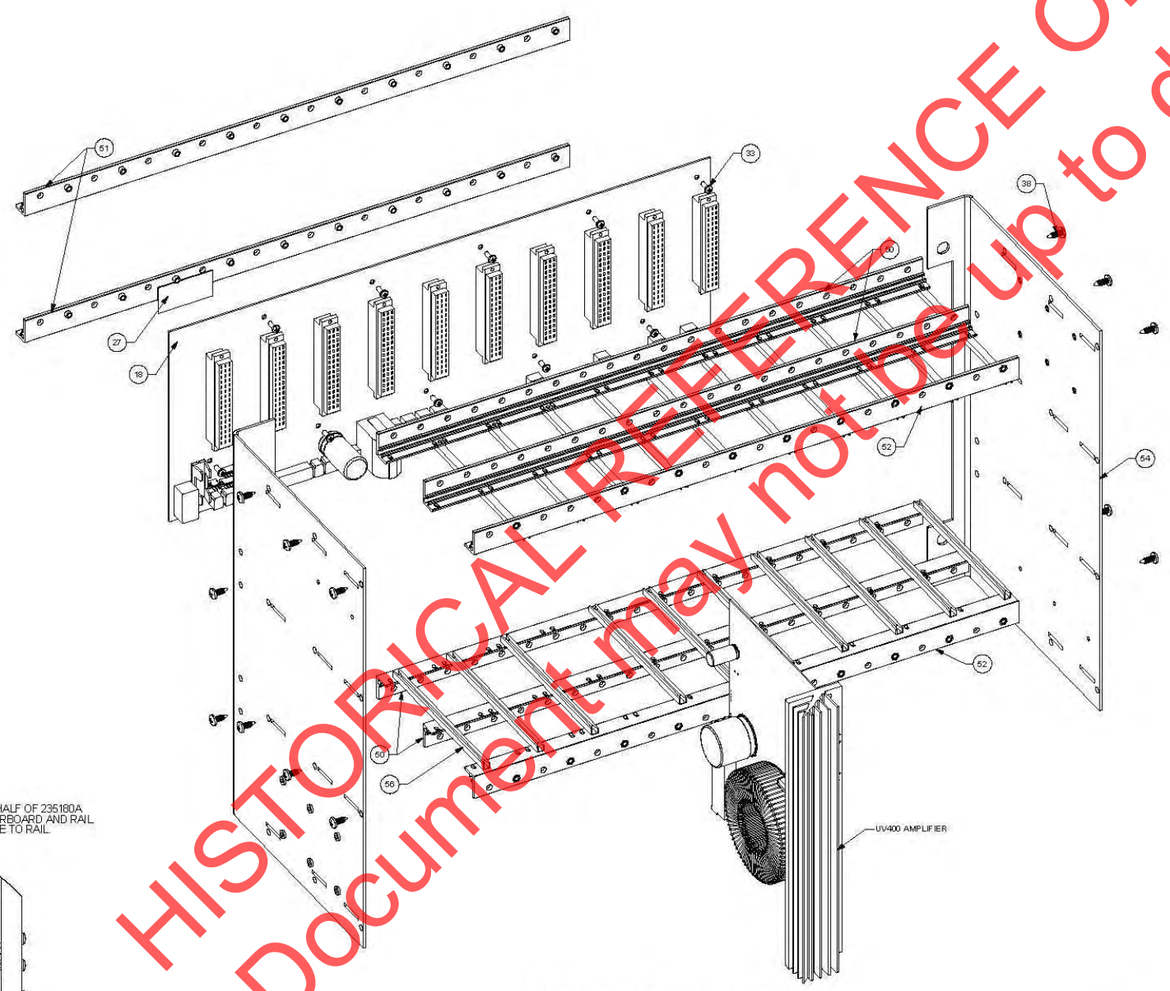
FINISH:	N/A
	REMOVE BURRS, SHARP CORNERS AND EDGES
MATERIAL:	N/A
UNITOF MEASURE	RF
NAME:	FINAL ASSEMBLY UVT6048

Tolerances Unless Otherwise Specified
Angles ------ ±0.5°
X.XX ------ ±0.015
X.XXX ------ ±0.005

SIGNAL DIVISION
Federal Signal Corporation
2645 FEDERAL SIGNAL BLVD - UNIVERSITY PARK, IL 60466

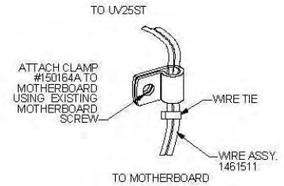
DRAWN BY: MAF	CHKD. BY: MJF	SCALE AT D SIZE:
DATE: 11/8/01	DATE: 11/28/01	NONE

DRAWING NUMBER: SHEET 1 OF 2
8600115A



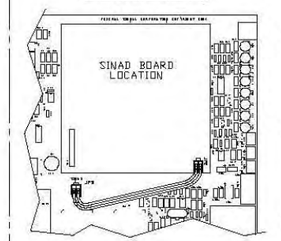
CAGE ASSEMBLY-SECONDARY CONTROL

UV25ST OPTION



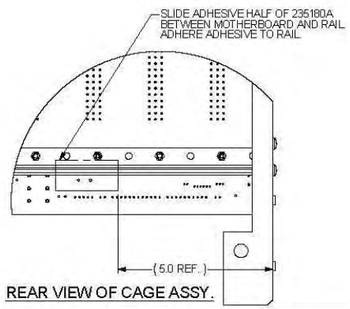
WHEN USING UV25ST OPTION, AMPS ARE GROUPED TOGETHER WITH UV25ST'S GROUPED TO THE RIGHT OF THEM. CONNECT THE AMPLIFIER OUTPUT TO THE UV25ST USING THE 1461511A WIRE SET.

FS-SINAD OPTION



SINAD BOARD CONNECTION TO UV CONTROLLER BOARD 2005141

FS-SINAD OPTION		
QTY.	PART NO.	DESCRIPTION
1	2005186C	SINAD BOARD
2	7000444A-05	SCR, MACH, PHIL HD., 4-40, S.S.
2	7075080A	LKWASHER, INT. TOOTH, #4, S.S.
2	8552A125A	WASHER, FLAT, TEFLON



REAR VIEW OF CAGE ASSY.

Tolerances Unless Otherwise Specified:
Angles: ------ ±0.5°
X.XX ------ ±0.015
X.XXX ------ ±0.005

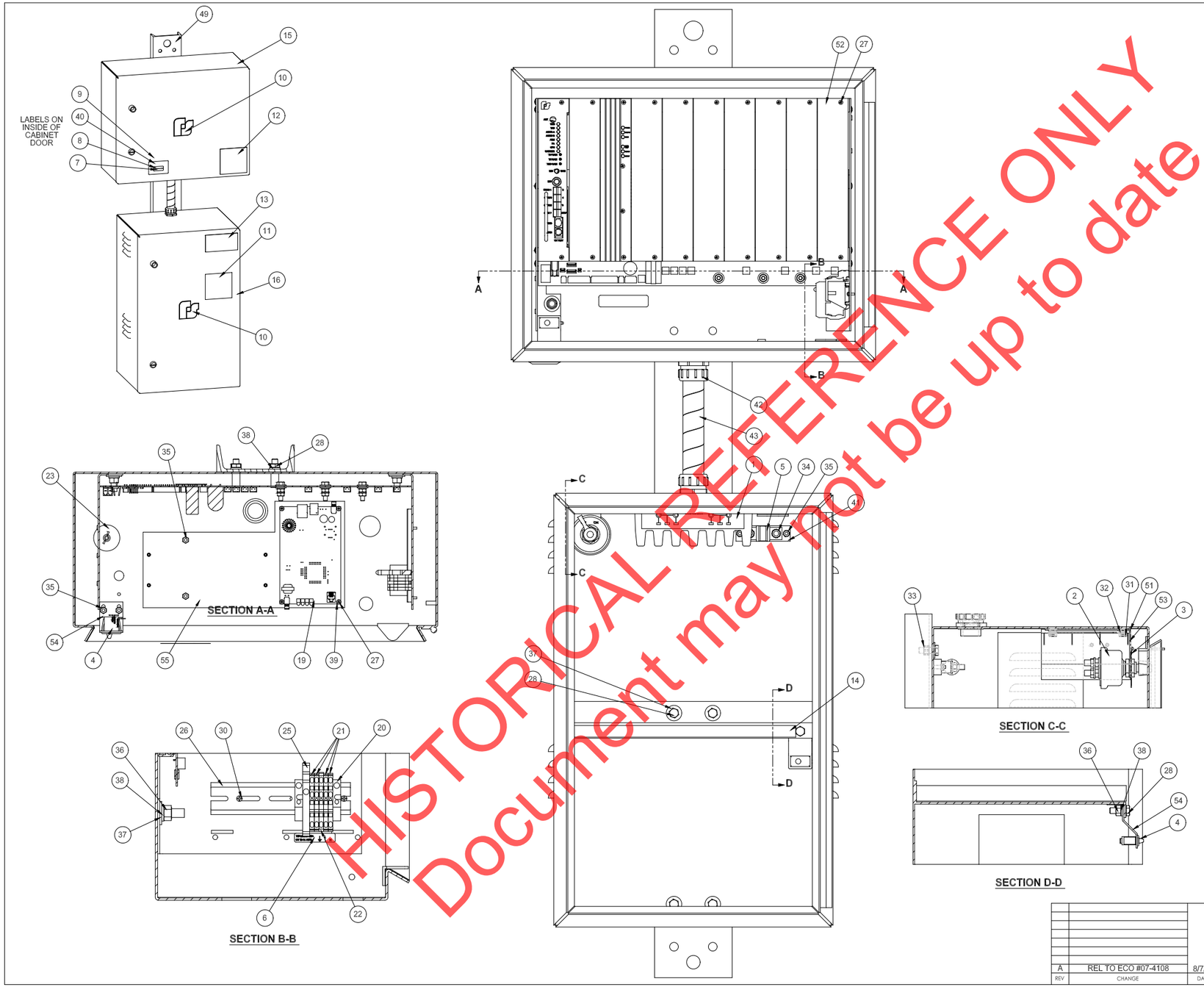
SIGNAL DIVISION
Federal Signal Corporation
2645 FEDERAL SIGNAL DRIVE - UNIVERSITY PARK, IL 60466

FINISH: N/A
REMOVE BURRS, SHARP CORNERS AND EDGES
MATERIAL: N/A
UNITOP MEASURE: RF

DRAWN BY: MAF DATE: 11/8/01
CHKD. BY: MJF DATE: 11/28/01
SCALE AT D SIZE: NONE

NAME: FINAL ASSEMBLY UVT6048
DRAWING NUMBER: SHEET 2 OF 2
8600115A

REV	CHANGE	DATE	BY
A29	SEE SHEET 1	"	"



ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	120816B	CHARGER,24V,10A
2	1	122323A-01	SWITCH,DISCONNECT
3	1	122323A-02	FACE PLATE,DISCONNECT SWITCH
4	2	122378A	SWITCH, INTRUSION, SPDT
5	1	148A147A	FUSE, 200A
6	1	1612393B	LABEL,DIN RAIL,UV,120V
7	1	1612590A-01	LABEL,UV MODELS,SERIAL NUMBER
8	1	1612590A-22	LABEL,UV MODELS,UVTD-IP
9	1	1612875A-XX	LABEL,UL ELEC RATINGS (See dwg. 1612875A for no.)
10	2	161693A	LABEL,FS LOGO
11	1	161767A	LABEL,BATTERY WARNING
12	1	161A509A	LABEL, WARNING, CNTRL
13	1	161A510A	LABEL,WARNING,BATTERY BOX
14	1	161B511A	LABEL,DANGER,BATTERY SHELF
15	1	170345B	CABINET,CNTL,ALUM
16	1	170346B	CABINET,BATT.,ALUM.
17	1	2005141E	PCBA,UV CONTROLLER
18	1	2005147F	PCBA,U/V MOTHERBOARD
19	1	2005457C	PCBA,SERIAL TO ETHERNET CONVERTER
20	2	229218A	BRKT,T,BLOCK END
21	4	229282A	TERM BLOCK,1-POLE,35MM DIN
22	1	229288A	GROUND TERM. BLOCK, 3-POS, 35MM DIN
23	1	231194A	PLUG,HOLE,1.38,SS
24	1	235180A	INSULATOR,FISHPAPER,0.03 THK.
25	1	288454B	INPUT MODULE,120V
26	1	288810A-06	DIN RAIL,ALUM,UNCOATED,6.00"
27	34	7000A419-06	SCREW, MACH., PAN HD, 6-32 X 3/8
28	11	7002A009-16	BOLT,HEX HD,SS,3/8-16 X 1
29	16	7011194A-08	SCREW,TAPTITE,PHIL,10-24 X 1/2
30	2	7011A152-06	#8 SHT.MTL.SCREW,S.S.
31	4	7058050A	NUT,MACH SCR,KEPS,1/4-20
32	4	7058055A	NUT, ELASTIC STOP, HEX, LIGHT,THIN, 1/4-20,SS
33	6	7058065A	NUT,KEPS,3/8-16,SS
34	2	7058A033	NUT,MACH SCR,KEPS,5/16-18
35	6	7058A047	NUT,MACH SCR,KEPS,10-32
36	5	7059A063	NUT, 3/8-16
37	10	7072A035	FLT. WSHR., SS, 3/8
38	9	7074A046	LKWSHR, SPLT, SS, 3/8
39	4	7075A011	WASHER, INT TTH, #6
40	1	81461875B	LABEL,SIREN CONTROLLER,U.L.
41	1	8402A066A	FUSE BLOCK ASSEMBLY
42	2	8402A068A	FITTING,1" CONDUIT,CARLON
43	1	8581025A	1" COND,LIQUI-TITE,7.5"
44	4	8600100A	RAIL,ULTRA VOICE
45	2	8600100A-01	RAIL ASSY,ULTRA V CAGE,MOTHERBOARD
46	1	8600100A-02	RAIL ASSY,CAGE,FRONT,TOP
47	1	8600100A-03	RAIL ASSY,CAGE,FRONT,BOTTOM
48	2	8600101B-01	END PLATE,ASSY,ULTRAVOICE CAGE
49	1	8600106C	CHANNEL,MTG.,CABINET
50	20	8600108A	CARD GUIDE,NYLON,6"
51	1	8600112a-01	BRKT,ASSY,PWR,SUPPLY
52	8	8600113A	FACEPLATE,BLANK
53	1	8600116A	BRACKET,MTG,SWITCH,DISCONNECT
54	2	8600118B	BRACKET,INTRUSION SWITCH
55	1	8605123A-01	PLATE ASSY,BROADBAND,UVTD-IP
**	10	150A109	CLAMP,CABLE TIE WRAP
**	9	150A130A	TIE,CABLE MOUNT
**	6	150A146A	TIE WRAP,UV STABILIZED
**	1	1612354A-21	LABEL,SHIPPING,UVTD-IP MODEL
**	4	8402A070A-01	TRAY,BATTERY,LARGE
**	.05OZ	R70-08-03	ADHESIVE,RTV 6708,SIL
*	1	1461243A	WIRE LEAD,POWER SUPPLY
*	1	1461309A	WIRE LEAD,CHARGER SENSE
*	1	1751064A-04	CABLE,AC,W/FERRULES
*	1	1751186B-03	CABLE,MODULAR,6 COND,1 TO 6,3 FT.
*	1	1751413A	CABLE,ETHERNET,CROSSOVER,RJ45,CAT5E,1 FT.
*	1	1751415A	CABLE,2 COND,SHIELD,W/FERRULES & RING TERM
*	2	C300218-09-119	C-WIRE,WHT,5"
*	2	C300218-10-258	C-WIRE,BLK,5"
*	1	C300422-02-168	C-WIRE,RED,15"
*	1	C300422-10-165	C-WIRE,BLK,15"
*	1	T300104-02-010	T-WIRE,RED,14"
*	1	T300104-02-014	T-WIRE,RED,20"
*	1	T300104-02-016	T-WIRE,RED,30"
*	2	T300104-09-001	T-WIRE,WHT,13"
*	3	T300104-09-004	T-WIRE,WHT,30"
*	1	T300104-10-011	T-WIRE,BLK,28"
*	1	T300112-02-056	T-WIRE,RED,21"
*	1	T300112-05-005	T-WIRE,GRN,5"
*	1	T300420-05-011	T-WIRE,GRN,69"
*	1	T300422-02-094	T-WIRE,RED,28"
*	1	T300422-03-059	T-WIRE,ORN,18"
*	1	T300422-03-060	T-WIRE,ORN,70"
*	1	T300422-06-060	T-WIRE,BLU,28"
*	1	T300422-10-099	T-WIRE,BLK,28"
**	1	8549A178A	ACCESSORY KIT,DESICCANT
**	1	8549A193A	LIGHTNING PROTECTOR
**	1	255354P	MANUAL,ULTRAVOICE
**	0	8500858A	INSPECTION SHEET,FINAL
**	REF	82261026A	DIM.OUTLINE,ULTRAVOICE
**	REF	8500811B	TEST PROC.,FINAL ASSY,UV
**	REF	8500813C	PRODUCT SPEC,ULTRAVOICE
**	REF	8500833A	FINAL TEST DATA,UV
*	REF	259242A	WIRING DIA,BROADBAND,UVTD-IP

* SEE WIRING DIAGRAM
** ITEM NOT SHOWN

Tolerances Unless Otherwise Specified
Angles ------- ±0.5°
X.XX ---------- ±0.015
X.XXX --------- ±0.005

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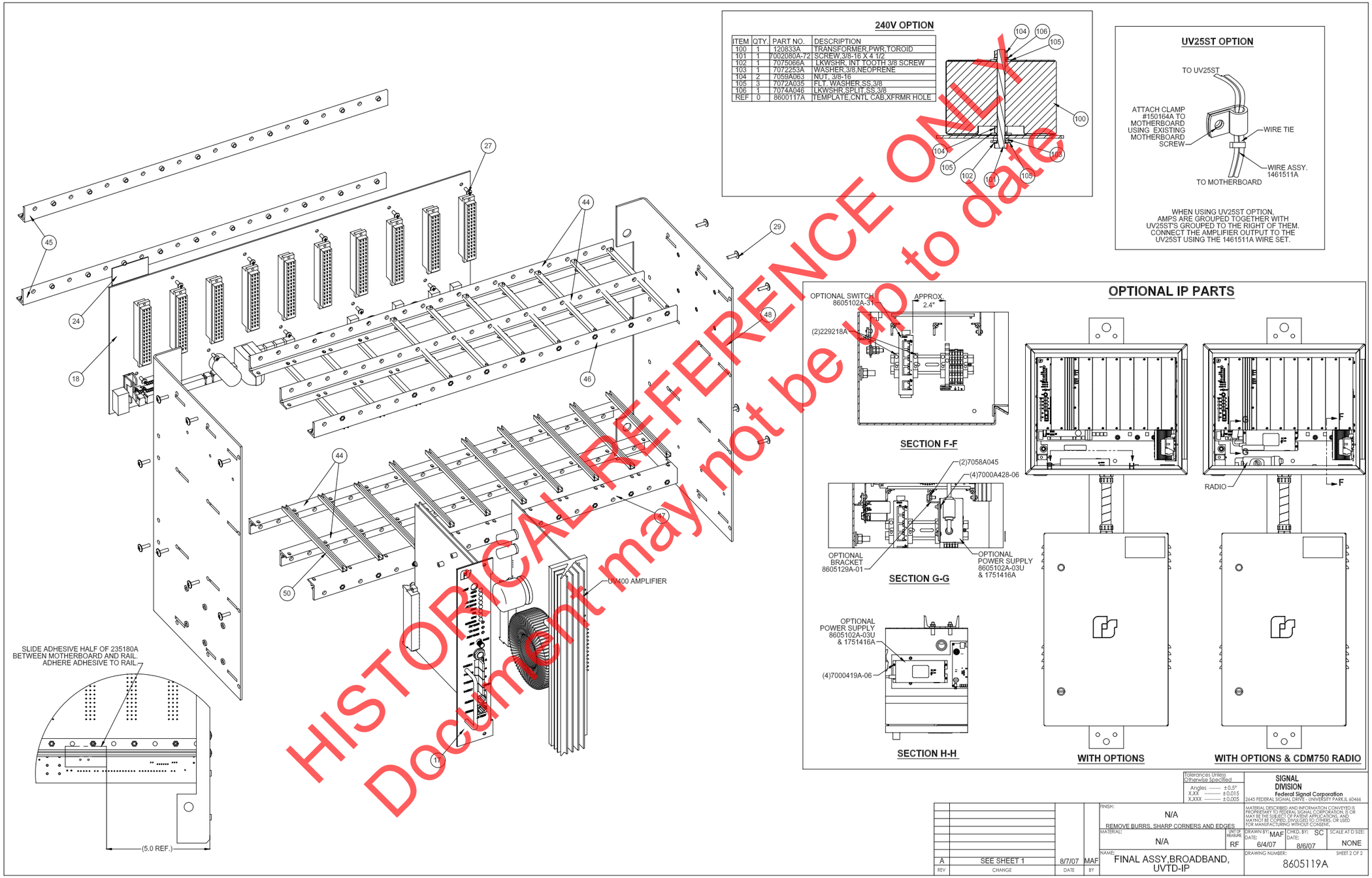
REV	CHANGE	DATE	BY
A	REL TO ECO #07-4108	8/7/07	MAF

FINISH: N/A
REMOVE BURRS, SHARP CORNERS AND EDGES
MATERIAL: N/A
UNIT OF MEASURE: RF
NAME: FINAL ASSY,BROADBAND, UVTD-IP

DRAWN BY: MAF DATE: 6/4/07
CHKD. BY: SC DATE: 8/6/08
SCALE AT D SIZE: NONE
DRAWING NUMBER: 8605119A
SHEET 1 OF 2



A	SEE SHEET 1	8/7/07	MAF	FINISH: N/A; REMOVE BURRS, SHARP CORNERS AND EDGES		
REV	CHANGE	DATE	BY	MATERIAL: N/A	UNIT OF MEASURE: RF	DRAWN BY: MAF DATE: 6/4/07; CHKD. BY: SC DATE: 8/6/07; SCALE AT D SIZE: NONE
				NAME: FINAL ASSY,BROADBAND, UVTD-IP		DRAWING NUMBER: 8605119A; SHEET 2 OF 2

Tolerances Unless Otherwise Specified: Angles ±0.5°; X.XX ±0.015; X.XXX ±0.005

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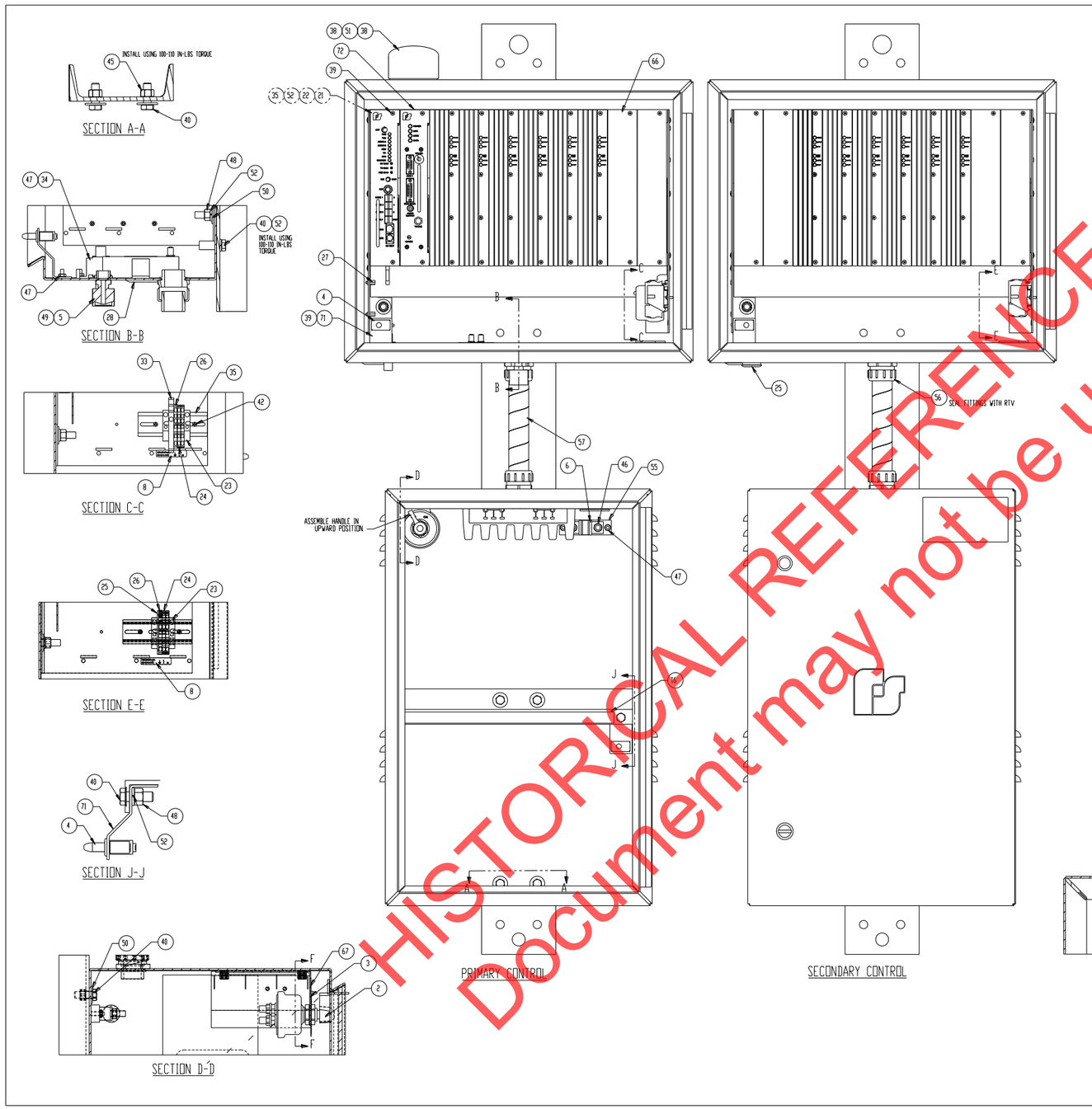

ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	2	1210868	CHARGER,24V,10A
2	2	122323A-01	SWITCH,DISCONNECT
3	2	122323A-02	FACE PLATE,DISCONNECT SWITCH
4	4	122378A	SWITCH, INTRUSION, SPDT
5	1	1405406	STRIP,1/2"X1/2"NYLON
6	2	148A147A	FUSE, 20A
7	1	148A148A	FUSE, 6 AMP
8	2	1612393B	LABEL,DIN RAIL,UV,120V
9	1	1612590A-01	LABEL,UV MODEL & SERIAL NUMBER
10	1	1612590A-XX	LABEL,UV MODULE (See dwg. 1612590A for no.)
11	1	1612875A-XX	LABEL,UL ELEC RATINGS (See dwg. 1612875A for no.)
12	4	1616934	LABEL,FS LOGO
13	2	1617767A	LABEL,BATTERY WARNING
14	2	1618509A	LABEL, WARNING, CNTRL
15	2	1618510A	LABEL,WARNING,BATTERY BOX
16	2	1618511A	LABEL,DANGER,BATTERY SHELF
17	2	1703458	CABINET,CNTL,ALUM
18	2	1703468	CABINET,BATT,ALUM
19	1	2005151	PCBA 400W AMP,UL TRAVITOR
20	1	2005141E	PCBA,UV CONTROLLER
21	1	2005147F	PCBA,UV MOTHERBOARD
22	1	20052408-02	RECEIVER MODULE,HIGH BAND
22	1	20052408-02N	RECEIVER MODULE,HIGH BAND NARROW
22	1	20052408-03	RECEIVER MODULE,LOW BAND
23	4	229219A	BRKT,T & DCK GRD
24	4	229282A	TERM BLOCK,1 POLE,25MM DIN
25	1	229283A	CAP,END,TERM BLK,1 P.
26	2	229288A	GROUND TERM BLOCK, 3-POS, 35MM DIN
27	6	230286A	SCREW,SS,HEX,6-32X.375,NYLON
28	2	231194A	PLUG,HOLE,1.38,SS
29	1	231198A	PLUG,HOLE,.088" DIA
30	1	233108A	INSULATOR,FISHPAPER,.003 THK.
38	1	2402048	ANTENNA,161.5MHz
32	1	288882A	PCB,TYPHASER,1450MHz
33	1	288945B	INPUT MODULE,120V
34	1	288969A-03	KIT,ANTENNA,LHTG PRO,125-1000 MHZ
35	2	288810A-04	DIN RAIL,ALUM,UNCDATED,4.00"
37	2	70004444-20	SCREW,MACH,PHIL,4-40 X 1 1/4
38	6	7000486A-10	SCR MACH M4x8.7
39	40	70004479-06	SCREW, MACH, PAN HD, 6-32 X 3/8
40	22	7002A009-16	BOLT,HEX HD,SS,3/8-16 X 1
41	16	70111944-08	SCREW,TAPTITE,PHIL,10-24 X 1/2
42	4	7011A152-06	#8 SHT.MTL SCREW,S.S.
43	8	7058050A	NUT,MACH SCR,KEPS,1/4-20
44	8	7058055A	NUT, ELASTIC STOP, HEX, LIGHT,THIN, 1/4-20,SS
45	12	7058065A	NUT,KEPS,3/8-16,SS
46	4	7059A033	NUT,MACH SCR,KEPS,5/16-18
47	10	7059A047	NUT,MACH SCR,KEPS,10-32
48	10	7059A063	NUT, 3/8-16
49	1	7063x601a	LOCKNUT,STEEL,1/2
50	20	7072A035	FLT. WSHR, SS, 3/8
51	6	7074077A	LOCK WASHER SPLIT #4
52	18	7074A046	LKWSHR, SPLT, SS, 3/8
53	2	7075880A	LOCKWASHER, INT TOOTH FOR #4 SCREW
54	1	8146187SB	LABEL,SIREN CONTROLLER,UL
55	2	8402A066A	FUSE, BLOCK ASSEMBLY
56	4	8482A068A	FITTING,1" CONDUIT,CARLON
57	2	858182SA	1" COND,LIQUI-TITE,7.5"
58	4	8600100A	RAIL,ULTRA VOICE
59	2	8600100A-01	RAIL ASSY,ULTRA V CAGE,MOTHERBOARD
60	1	8600100A-02	RAIL ASSY,CAGE,FRONT,TOP
61	1	8600100A-03	RAIL ASSY,CAGE,FRONT,BOTTOM
62	2	8600101B-01	END PLATE,ASSY,ULTRAVOICE CAGE
63	2	8600106C	END PLATE,ASSY,ULTRAVOICE CAGE
64	2	8600108A	BRACKET,MTG,SWITCH,DISCONNECT
65	1	8600113A	SATELLITE MODULE ASSEMBLY
66	6	8600113A	FACEPLATE,BLANK
67	2	8600116A	BRACKET,MTG,SWITCH,DISCONNECT
68	4	8600118B	BRACKET,INTRUSION SWITCH
69	1	8604100A	SATELLITE MODULE ASSEMBLY

ITEM NO.	QTY.	PART NO.	DESCRIPTION
xx	20	150A109	CLAMP,CABLE TIE WRAP
xx	18	150A130	TIE,CABLE MOUNT
xx	12	150A146A	TIE WRAP,BLACK
xx	1	161235A-XX	LABEL,SHIPPING(See parts list for part #)
xx	1	2402803A	SATELLITE DISH,1.2M,KU/KY
xx	1	2402844A	ANT,LNB,1000H SERIES,KU BAND
xx	1	8604114B	FINAL ASSY, SAT POLE MOUNT
xx	1	1395105A	FITTING,COMPRESS,UNIVERSAL 6 SERIES
xx	1	146A300C	CABLE,ANT,VSR,25'
xx	1	1751392A	CABLE,RG-6/U,75OHM COAX 25FT
xx	1	1751391A	CABLE,B915,RJ-11 PLUG
xx	1	1751392A	CABLE,AUDIO,PHONO PLUG
xx	1	1751393A	CABLE,POWER PLUG
xx	1	1751397A	CABLE,COAXIAL,"F" PLUG
xx	1	1759824-08	CABLE,ANT,SMA/P,259,42"
xx	8	8402A070A-01	TRAY,BATTERY,LARGE
xx	1	R95-10-01	SEALANT TAPE COAX CONN 1/8" STRIP 2 PK
xx	1 OZ	R72-02-01	LOCTITE #271 HIGH STRENGTH
x	1	1461243A	WIRE LEAD,POWER SUPPLY
x	1	1461395A	WIRE LEAD,CHARGER SENSE
x	1	1758594	CABLE,I2C INTERCONNECT
x	1	1759824-11	CABLE ANTENNA SMA TO N
x	2	1751064A-04	CABLE,AC TERMINATED
x	1	1751379A	CABLE,ANT,AMO-SMA
x	1	1751382A	CABLE,RG-6/U,75OHM COAX
x	1	1751391A	CABLE,B915,RJ-11 PLUG
x	1	1751397A	CABLE,COAXIAL,"F" PLUG
x	1	1751392A	CABLE,AUDIO,PHONO PLUG
x	1	1751393A	CABLE,POWER PLUG
x	3	2244213A-01	CONN,CTOR BUTT 22-18 GA
x	1 OZ	R70-08-03	ADHESIVE,RTV
x	1 OZ	R73-02-01	SILICONE, ELECTRICAL INSULATING DC4
x	1	C308218-09-119	WIRE,CUT,WHT,5"
x	1	C308218-10-258	WIRE, CUT,BLK,5"
x	1	R308A112-05	WIRE 12 AWG PVC GRN 7/25'
x	1	R308A112-09	WIRE 12 AWG PVC WHT 7/25'
x	1	R308A112-10	WIRE 12 AWG PVC BLK 7/25'
x	2	T308104-02-010	T-WIRE,RED,14"
x	2	T308104-02-014	T-WIRE,RED,20"
x	2	T308104-02-016	T-WIRE,RED,28"
x	4	T308104-09-001	T-WIRE,13"
x	6	T308104-09-004	T-WIRE,20"
x	1	T308104-10-008	T-WIRE,BLK,87"
x	2	T308104-10-011	T-WIRE,BLK,28"
x	1	T308112-05-005	T-WIRE,GRN,5"
x	1	T308422-02-094	T-WIRE,RED,28"
x	1	T308422-03-063	T-WIRE,126"
x	1	T308422-03-059	T-WIRE,ORG,18"
x	2	T308422-03-060	T-WIRE,ORG,78"
x	1	T308422-05-011	T-WIRE,ORG,69"
x	1	T308422-05-041	T-WIRE,GRN,82"
x	1	T308422-06-060	T-WIRE,BLU,28"
x	2	T308422-09-074	T-WIRE,WHT,87"
x	1	T308422-10-099	T-WIRE,BLK,28"
xxx	1	255354P	MANUAL
xxx	2	854917BA	ACCESSORY KIT,DESICCANT
xxx	1	854918J3A	LIGHTNING PROTECTOR
REF	0	2592B8A	WIRING DIA, UV 6048-SAT2
REF	0	82261026A	DIMENSIONAL OUTLINE
REF	0	8508811B	TEST PROC,UV FINAL ASSY
REF	0	8508803B	PRODUCT SPEC

x SEE WIRING DIAGRAM
xx NOT SHOWN ON DRAWING
xxx INCLUDED BUT NOT INSTALLED

REV	CHANGE	DATE	BY
A	SEE ECO# 06-4120	9/25/06	VT

Tolerances Unless Otherwise Specified
Angles ------- ±0.5°
X.XX ----------±0.015
X.XXX ---------±0.005

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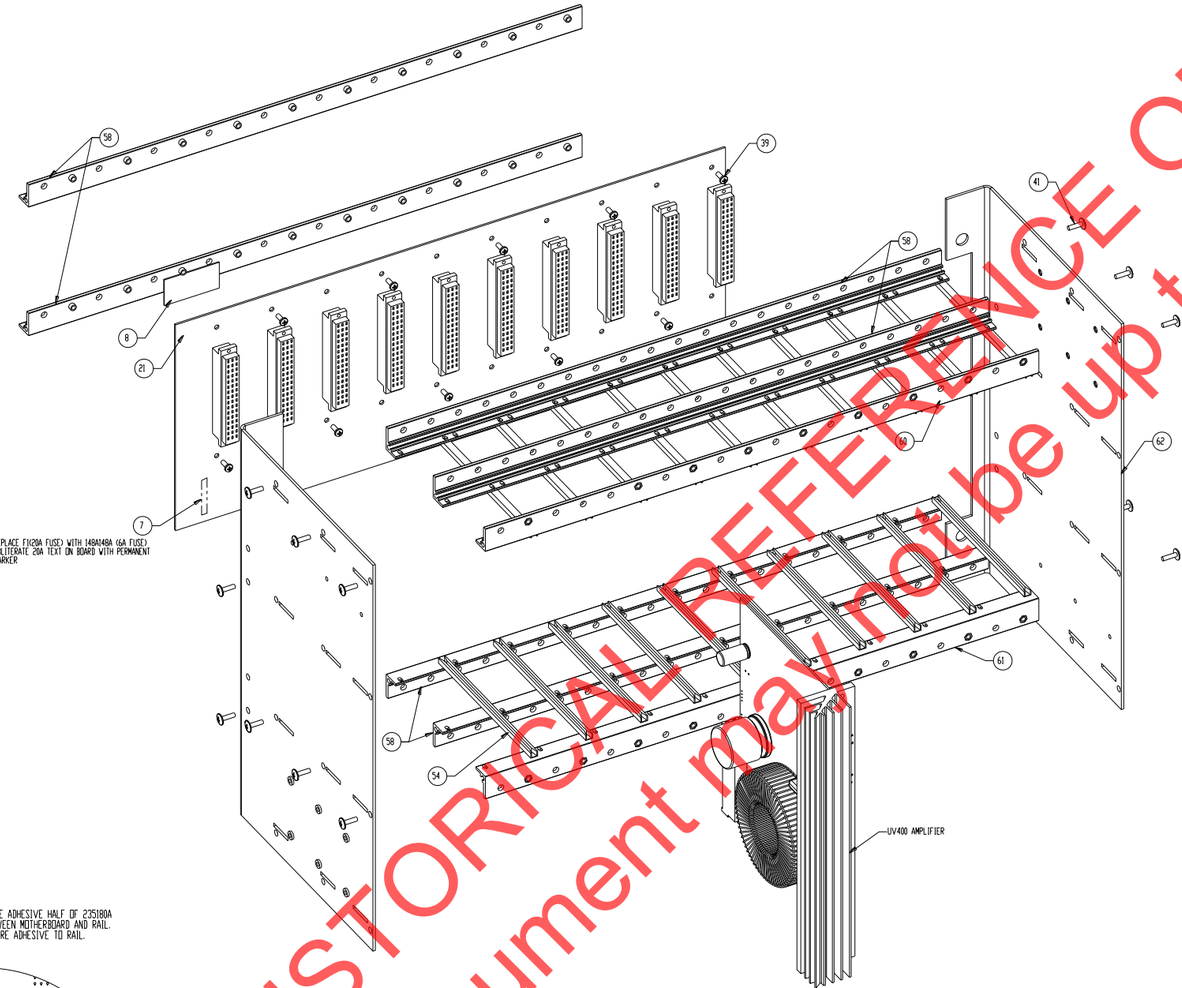
FINISH: N/A
REMOVE BURRS, SHARP CORNERS AND EDGES
MATERIAL: AS SPECIFIED
UNIT OF MEASURE: RF

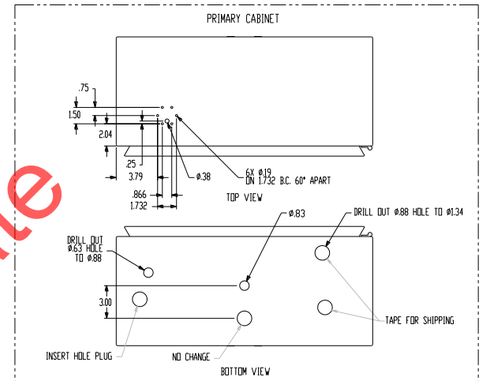
MATERIAL DESCRIBED AND INFORMATION CONVEYED IS PROPRIETARY TO FEDERAL SIGNAL CORPORATION, IS OR MAY BE THE SUBJECT OF PATENT APPLICATIONS, AND MAY OR MAYNOT BE LOANED, REVEALED TO OTHERS, OR USED FOR MANUFACTURING WITHOUT CONSENT.

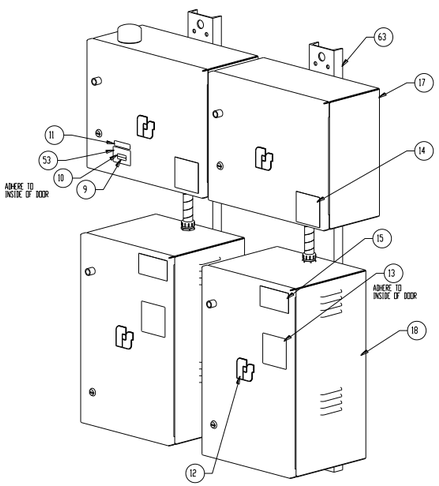
DRAWN BY: VT DATE: 9/25/06
CHK'D BY: SC DATE: 6/4/07
SCALE AT 'D' SIZE: NONE

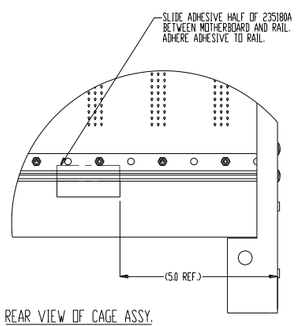
NAME: FINAL ASSEMBLY, UV 6048-SAT2 ULTRAVOICE RECEIVER 2-WAY SATELLITE
DRAWING NUMBER: 8600127A
SHEET 1 OF 2



CAGE ASSEMBLY-SECONDARY CONTROL

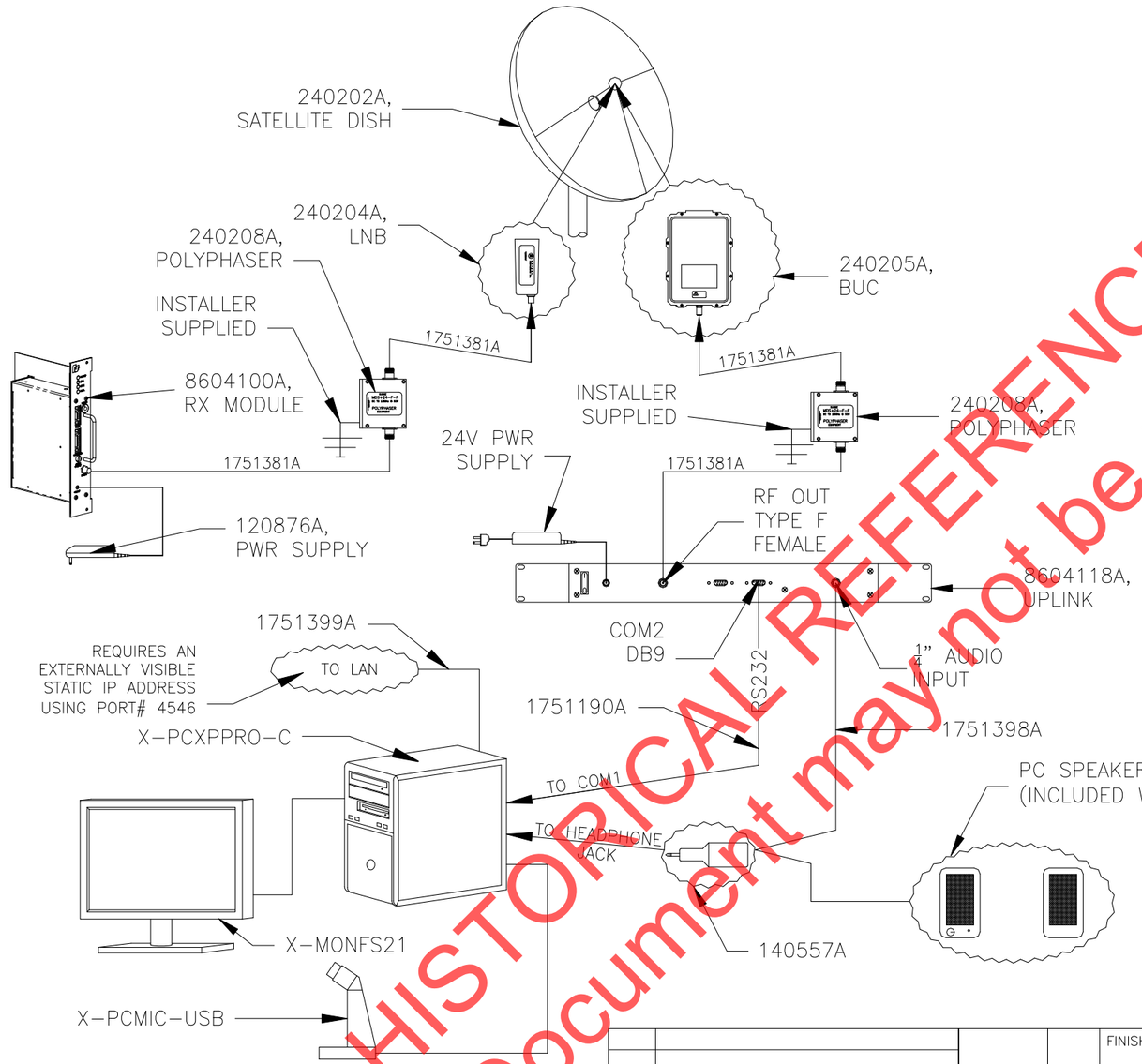






REAR VIEW OF CAGE ASSY.

				Tolerances Unless Otherwise Specified: Angles ±.5°; X.XX ±0.015; X.XXX ±0.005	SIGNAL DIVISION, Federal Signal Corporation, 2645 FEDERAL SIGNAL DRIVE - UNIVERSITY PARK,IL 60466
				FINISH: N/A; REMOVE BURRS, SHARP CORNERS AND EDGES	MATERIAL DESCRIBED AND INFORMATION CONVEYED IS PROPRIETARY TO FEDERAL SIGNAL CORPORATION, IS OR MAY BE THE SUBJECT OF PATENT APPLICATIONS AND MAY OR MAYNOT BE LOANED, DISCLOSED TO OTHERS, OR USED FOR MANUFACTURING WITHOUT CONSENT
				MATERIAL: N/A; HEAT TREAT: N/A	DRAWN BY: VT DATE: 9/25/06; CHKD BY: SC DATE: 6/4/07; SCALE AT 'D' SIZE: NONE
A	SEE SHEET 1	XX/XX/XX	XX	NAME: FINAL ASSEMBLY UVT6048	DRAWING NUMBER: SHEET 2 OF 2, 8600115A
REV	CHANGE	DATE	BY		



SATELLITE, KU BAND, PART LIST		
PART #	DESCRIPTION	QTY
240205A	ANTENNA, BUC, KU BAND, 3-WATT, TYPE F CONNECTOR	1
240204A	ANTENNA, LNB, 1000H SERIES, KU BAND	1
240202A	SATELLITE DISH, 1.8M, KU, RX/TX	1
1751381A	CABLE, RG-11/U, 75 OHM COAX, 500' ROLL	1
240208A	POLYPHASER, 75 OHM, EXTERIOR	2
1391506A	UNIVERSAL 11-SERIES COMPRESSION FITTING	10
1751190A	CABLE, SERIAL, UPLINK TO PC	1
R95-10-01	SEALANT TAPE, COAX CONNECTOR	3
150A146A	TIE WRAP, 8", NYLON, BLACK	25
1751398A	CABLE ASSY.,AUDIO,¼"MALE MONO PLUG, ⅛"MALE STEREO PLUG,12' LONG	1
8604118A	SATELLITE, FSK UPLINK, KU-BAND	1
X-PCXPPRO-C	DESKTOP COMPUTER, DELL OPTIPLEX GX620 MT	1
X-MONFS21	MONITOR, 21" FLATSCREEN, PRO SERIES, VIEWSONIC, VP2130B	1
X-PCMIC-USB	MICROPHONE, PC, USB, DESKTOP	1
140557A	HEADPHONE ADAPTER, TWO ⅛" PHONE PLUGS, FITS ⅛" STEREO PHONE JACK	1
1751399A	CABLE, ETHERNET, 14', CAT5E	1
120876A	XFMR, POWER SUPPLY, 24VDC, 1000MA, 2.1MM JACK	1

INSTALLER NOTES:
1) INSTALLER TO CUT 1751381A COAX TO LENGTH, TERMINATE WITH 1391506A CONNECTORS.
2) ALL EXTERNALLY INSTALLED 1391506A CONNECTORS TO BE SEALED WITH R95-10-01 SEALANT TAPE.
3) USE 150A146A TIE WRAPS AS NEEDED TO SECURE COAX OR OTHER CABLES.

REV.	CHANGE	DATE	BY
A1	SEE ECO # 07-4018	02/02/07	DJN
A	SEE ECO # 06-4140	11/14/06	DJN

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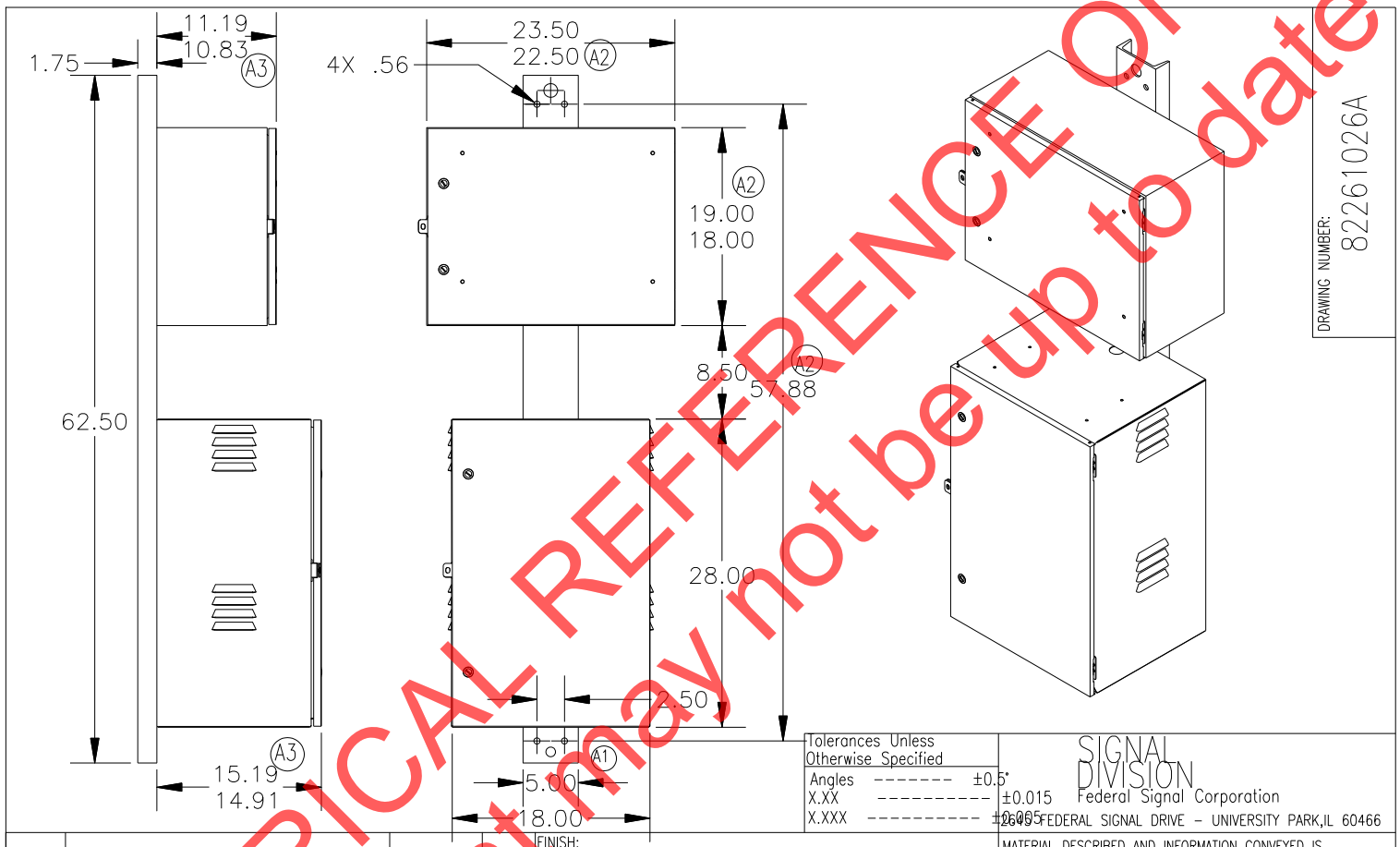
FINISH: REMOVE BURRS, SHARP CORNERS AND EDGES

MATERIAL: N/A — UNIT OF MEASURE: PC

NAME: SATELLITE, BASE STATION, KU BAND, SAT-KU

DRAWN BY DJN — DATE 11/14/06
CHKD. BY SC — DATE 11/20/06
SCALE AT B SIZE: DO NOT SCALE DRAWING

DRAWING NUMBER



REV	CHANGE	DATE	BY
A3	SEE ECO #03-4105	9/15/03	MAF
A2	SEE ECO #03-4046	3/24/03	MJF
A1	SEE ECO #02-4099	6/12/02	MAF
A	REL TO PROD ECO #01-4156	3/21/02	MAF

Tolerances Unless Otherwise Specified
Angles -------- ±0.5°
X.XX ---------- ±0.015
X.XXX ---------- ±0.005

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FINISH: N/A
REMOVE BURRS, SHARP CORNERS AND EDGES

MATERIAL: N/A
UNIT OF MEASURE: RF

NAME: DIMENSIONAL OUTLINE ULTRAVOICE

DRAWN BY: MAF DATE: 12/13/01
CHKD. BY: MJF DATE: 12/14/01
SCALE AT A SIZE: NONE

DRAWING NUMBER: 82261026A

SECTION XI
ADDENDUMS

There are currently no addendums to this manual.