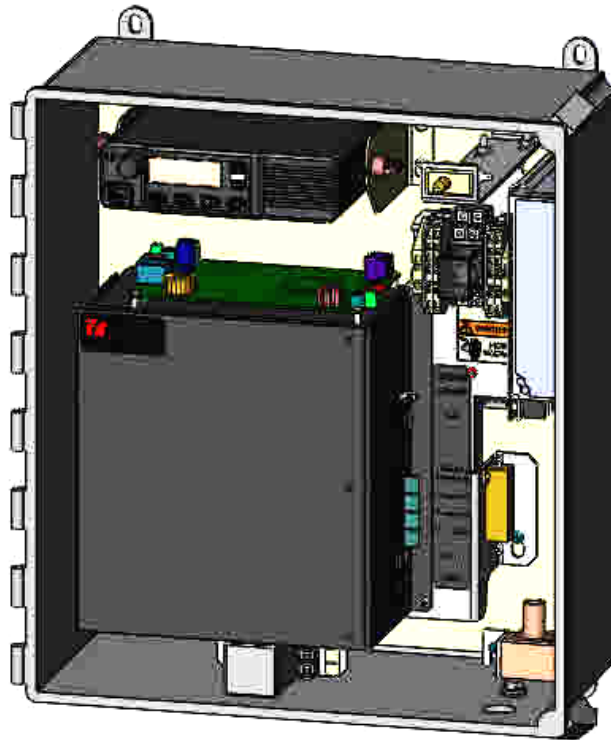![Federal Signal Safety and Security Systems logo]

UltraVoice® Remote Interface

Model: UVRI

Installation, Operation, and Service Manual

Limited Warranty

This product is subject to and covered by a limited warranty, <u>a copy of which can be found at www.fedsig.com/SSG-Warranty.</u> A copy of this limited warranty can also be obtained by written request to Federal Signal Corporation, 2645 Federal Signal Drive, University Park, IL 60484, email to info@fedsig.com or call +1 708-534-3400.

This limited warranty is in lieu of all other warranties, express or implied, contractual or statutory, including, but not limited to the warranty of merchantability, warranty of fitness for a particular purpose and any warranty against failure of its essential purpose.

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2   SAFETY MESSAGE

It is important to follow all instructions shipped with this product. This device is to be installed by trained personnel who are thoroughly familiar with the country electric codes and will follow these guidelines as well as local codes.

Listed below are important safety instructions and precautions you should follow.

Important Notice

Federal Signal reserves the right to make changes to devices and specifications detailed in the manual at any time in order to improve reliability, function or design. The information in this manual has been carefully checked and is believed to be accurate; however, no responsibility is assumed for any inaccuracies

PUBLICATIONS

Federal Signal recommends the following publications from the Federal Emergency Management Agency for assistance with planning an outdoor warning system:

- The "Outdoor Warning Guide" (CPG 1-17)
- "Civil Preparedness, Principles of Warning" (CPG 1-14)
- FEMA-REP-1, Appendix 3 (Nuclear Plant Guideline)
- FEMA-REP-10 (Nuclear Plant Guideline)

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.

- 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.

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 only experienced electricians should install this product in accordance with national, state and any other electrical codes having jurisdiction. Perform all work 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.

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.

WARNING

**Read and understand the information contained
in this manual, before attempting to install or
service this product.**

Pay careful attention to the following notices located on the equipment.

A. NOTICES - EXTERNALLY PLACED
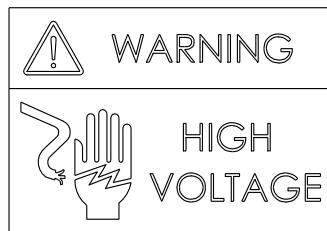
B. NOTICES-INTERNALLY PLACED
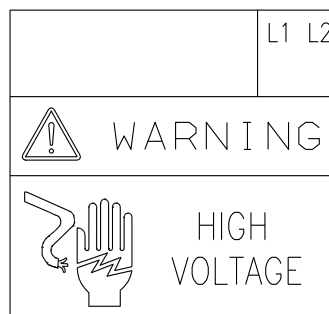
3   GENERAL DESCRIPTION

The UltraVoice Remote Interface (UVRI) provides remote control and status monitoring of Fire Alarm and PA systems to create a fully integrated indoor and outdoor Mass Notification System when used with the Federal Commander Digital Control System. The UVRI has a built-in radio transceiver interface, an RS232 port, and optional ethernet, satellite, and telephone line interfaces for tying into communication networks. Built-in warning tone generation, live voice and up to 8 minutes of local digital voice storage is included in all models.

The UVRI is housed in a non-metalic indoor/outdoor NEMA4X / UL50 rated enclosure suitable for wall mounting.

Features:
- 12VDC Operation
- Seven standard warning signals
- Single tone, Two-tone, DTMF, EAS and MSK decoders for remote siren control
- Integrated MSK radio modem with 128-bit encryption over radio or wire
- Local pushbutton control for 7 control functions
- Local microphone input
- Up to 8 minutes of digital voice storage
- Integrated radio modem
- RS232 port
- 2-Tone and DTMF decoders
- Radio Transceiver option
- Ethernet interface option
- 2-Way Satellite option
- Scrolling Message Display option
- Dedicated telephone line option
- Programmable radio receiver for Low Band, VHF, or UHF (optional)
- Windows® based siren programming software (optional)
- Diagnostic LEDs
- Quiet Test Diagnostics – Checks tone generator with 20KHz tone
- Remotely adjustable line level audio output
- DPDT 10 amp relay output
- Battery backup with built-in power supply/battery charger and low voltage cutoff
- Activation Test – Monitors tone generator and remote contact closure input
- Stackable siren functions enable user pre-defined warning scenarios
- Programmable over wireless radio channel using SFCDWARE
- NEMA4X / UL50 rated enclosure with padlock hasp

3.1   Model Number Descriptions

All UVRI models are set up for 2-way control and status monitoring using the Federal Commander Digital Control system. All models include 8 minutes of digital voice storage. Custom digital voice recording requires a model DVR.

CONTROLLER OPTIONS	UVRI MODEL #
NO RADIO (RF)	UVRI
UHF BAND Transceiver	UVRIU
HIGH BAND Transceiver	UVRIH
Landline Control	UVRI-LL
Ethernet Control	UVRI-IP
Satellite Control	UVRI-ISAT

Option Exclusions:

The UVRI-IP and UVRI-SAT options cannot be used with any other options listed above at the same time.

3.2   Recommended Cables

When equipped with a Vertex Radio (Model VX-2100) in your two-way RTUs, Federal Signal recommends purchasing the following cables for computer programming:

- RIB FIF-12A USB interface cable
- CT-104A interface cable

Use the RIB FIF-12A USB cable to connect to your computer. Use the CT-104A cable to connect from the RIB FIF-12A USB cable to the radio.

3.3 UVRI Part Locations:

Figure 3.1 - UVRI Inside View
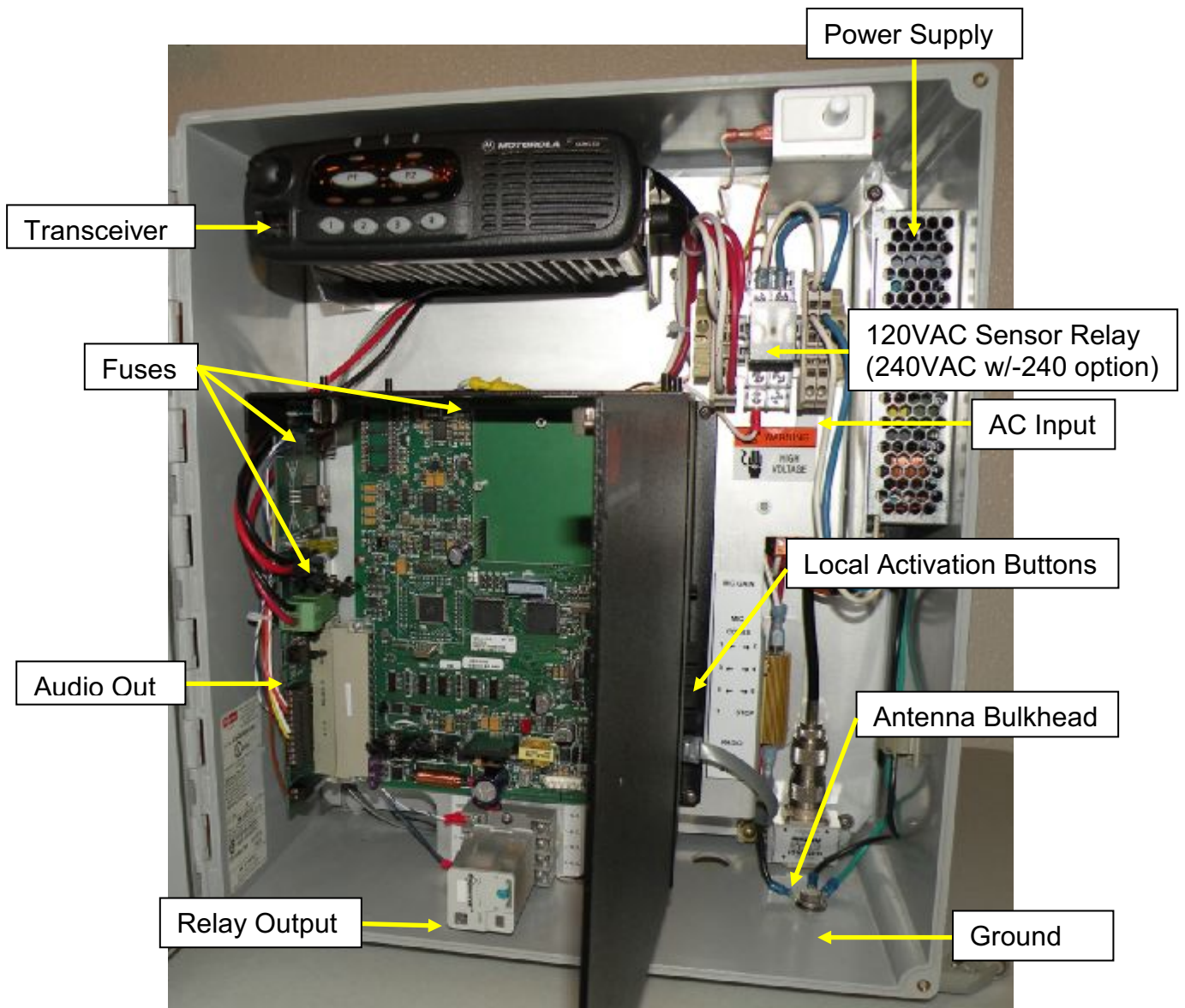
Figure 3.2 - UVRI Parts Layout

3.4   Initial Configuration

Each modular UVRI controller contains the following configuration parameters that must be initially configured. Additional programming configuration is required before placing the UVRI into service. Refer to the programming software reference manual for programming information.

1. Unit Type
2. RF Frequency
3. Security Key
4. 128-bit Encryption Key
5. Unit Address (see below)
6. Configuration Jumper Settings

3.4.1   Unit Type

The UVRI unit type is used to tell the front-end control system how to communicate with the UVRI. This is configured within the Federal Commander software and sent to the UVRI.

3.4.2   RF Frequency

The radio transceiver must be programmed with the RF frequency(s), channel spacing and power output before placing into service. These settings will be pre-set at the factory if the requirements are provided with the order.`

If a 1-way radio receiver is used with the UVRI, the RF frequency must be configured using Federal Signal configuration software and sent to the UVRI to put the receiver on the correct RF frequency. The frequency must stay within the correct RF band for the model purchased. The receiver will need re-alignment if the frequency is changed from the factory provided setting.

3.4.3   Security Key

The Security Key is a unique number assigned to the system that prevents nearby systems operating on the same RF frequency from interfering. Like the 128-bit encryption key, the Security Key is programmed during the flashing of the microprocessor and must match the key used at the control point. All sites in the system must use the same security key. The exception is a key value of 65535 (the default), defined as an "open" system and will communicate with all encoders regardless of the encoder's key setting.

3.4.4 128-bit Encryption Key

128-bit data encryption provides security against malicious operation or monitoring. The 128-bit key is programmed during the flashing of the microprocessor and must match the encoder (SS2000+ or SFCDWARE) being used to activate the unit. A key value of zero disables 128-bit encryption and must be used if the encoder does not support 128-bit encryption. <u>All sites in the system must use the same encryption key.</u>

3.4.5 Unit Address

Site Address Switch:
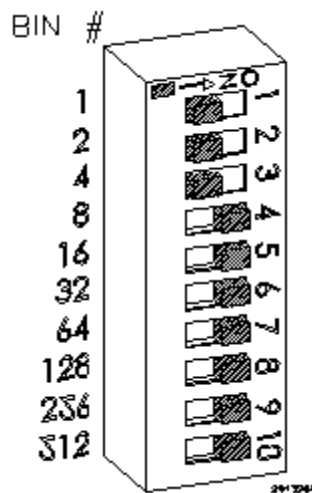
The unit address sets the UVRI site number and is used to numerically identify the site within the system network. The Unit Address is a three-digit number with a range of 001-1023. The unit address is set via dip switch S1. S1 Off position indicates active position. Add binary active switch positions to get ID address.

Switch No.	1	2	3	4	5	6	7	8	9	10
Binary No.	1	2	4	8	16	32	64	128	256	512

Example: The illustration above shows Switch numbers 1, 2 & 3 in the active position. The switch in the example above represents the binary numbers 1, 2 & 4, which when added, would equal unit address 7.

Note: The address must be set to address (one) to program a controller board to program a DTMF, non-digital unit. When the programming is completed, change the dip switch setting to the actual site address. Programming details are in the Commander software manual. The site address is stored when power is applied to the controller. If the site

address is changed, cycle power to the control board by removing the connector at JP3 on the motherboard for five seconds.

3.4.6 Control Board Configuration Jumper Settings

JP12 - Short to force radio Carrier Detect of External transceiver 1
- Jumper out = Default Setting

JP9 - External Transceiver #1 VOX (Audio level dependent Carrier Detect)
- Jumper OFF = VOX Disabled (Default setting)
- Jumper ON = Carrier detect in < 20mS when received audio exceeds 15% deviation.

JP10 - Dual receiver priority jumper:
- Jumper "EXT" side to give external receiver #1 priority
- Jumper "INT/EXT2" side to give on-board receiver or external receiver #2 priority
- Jumper neither side, first carrier detect has priority

JP7 – 600 Ohm Audio Output
- Jumper pins 2 and 3, Output radio transmit audio (Default Setting)
- Jumper pins 1 and 2, Output siren audio

JP6 – 600 Ohm Audio Input
- Jumper pins 2 and 3, Input audio to decoders as from a receiver (Default Setting)
- Jumper pins 1 and 2, Input audio to Amps when 600 Ohm PTT is asserted.

3.4.7 User Programs

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

1) Optional DTMF Activation Code
2) Optional Two-Tone Activation Code
3) Optional EAS Event Code
4) POCSAG code
5) Digital activation Code
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.

3.4.8 Available Functions:

Arm
Disarm
Report
Master Reset
Cancel
PA Output
Quiet Test
Low Power Mode
Hi Power Mode
Zone A (Not used with UVRI)
Zone B (Not used with UVRI)
Zone C (Not used with UVRI)
Zone D (Not used with UVRI)
Wail
Pulsed Wail
Alt Wail
Steady
Pulsed Steady
Alt Steady
Auxiliary (Chime)
Delay
Digital Voice (1-250)
Amp/Audio Zone Control (Not used with UVRI)

Power
Report
Record PA Message
Play Recorded PA Message
RelayN On (Not used with UVRI)
RelayN Off (Not used with UVRI)

3.4.9 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.

3.4.10 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.

3.4.11 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.

3.5   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.

3.6   Status Monitoring

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

3.6.1 Items monitored
    Siren Type
    Function State (code running)
    Unit ID
    Audio A*
    Audio B*
    Master Current / Remote System Operation*
    Battery Voltage
    Charger
    AC Power
    Control Box Intrusion
    False Alarm/Local Activation*
        *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.

GENERAL DESCRIPTION

4 SPECIFICATIONS

4.1 Electrical

Battery Voltage	On at 11.5 VDC / off at 10 VDC, 13.7 volts (nom.)
Battery Current	< 80 mA. standby current, < 120 mA during a function <7A during radio transmit
Stand By Time (with minimum 5-minute full signal reserve)	Greater than 24 hours (With radio transceiver, 10 W, 8 Tx / day)

4.2 Power Supply

AC Input	88-264 VAC, 50-60 Hz,
Input Current (115/230 VAC)	2.2/1.2 A
DC Output	13.5-16.5VDC (14VDC Nom.), 7A
Immunity	IEC61000-4-2,-3,-4,-5,-6,-8,-11
Conducted/Radiated EMI	EN55011/EN55022-B, FCC-B
Terminal Block Wiring	14-22 AWG
Terminal Block Torque	1-1.4 Nm torque

SPECIFICATIONS

4.3   Battery

Rating:	12 V, 12 A/H
Type:	PowerSonic PS12-120l Absorbed Glass Matt Valve Regulated Lead Acid (AGM - VRLA)

CAUTION: Substituting batteries may be hazardous and will void warranty.
Use specified batteries only.

4.4   Relay Output

Contacts	DPDT, 28 VDC, 277 VAC, 10 A

4.5   Control Board (2005698-01)

4.5.1 Serial & I^{2}C Ports

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

4.5.2 Signaling Formats

Number of codes	Up to 50 activation codes maximum
Number of Functions allowed stacked under each code	Up to 20
Two-Tone Sequential or Single Tone	282 Hz - 3000 Hz 0.5 sec (A) - .25 sec (B) minimum to 8 sec maximum
DTMF	3 to 12 digits standard 50 ms/50 ms timing or greater
FSK	
Baud rate	1200 bps
Modem type	MSK (minimal shift key)
Mark frequency	1200 Hz
Space frequency	1800 Hz
Error checking	16 bit CRC

SPECIFICATIONS

EAS   AFSK, 520.83 baud

      Modem Tones   2083.3 Hz and 1562.5 Hz

POCSAG
      Supports Binary frequency shift keyed, 512 Baud numeric messages.

4.6   Controller Front Panel Controls, Jacks, Switches and Indicators

4.6.1 Controls:

DV GAIN	Internal Digital Voice Level sufficient to drive TP3 or TP4 into clipping
TX GAINs	Transmitted Audio outputs adjustable from 50 mV to 1 Vpp
EXTERNAL REC GAINs	Received Audio Level inputs 300 mV to 3 Vpp
MIC GAIN	Local PA Level range sufficient to drive amplifiers into clipping w/50 mV nominal input level

4.6.2 Jacks:

MIC	10 k ohms input impedance, 50 mV nominal input level

External Transceivers   External Transceiver Connectors Pins
                                            Upper and Lower:

1	RX Audio in, 300 mVpp to 3 Vpp
2	TX Audio out, 50 mVpp to 3 Vpp
3	Carrier Detect, < 1 VDC for active
4	PTT, Active low, will sink 500 mA max.
5,7	8 VDC for Radio, 1.0 Amps max.
6,8	Ground, 1.5 Amps max. Current

Serial Port - Lower   8 Pin Serial Port:

2	Digital Receive / Serial Port Not
3	TX Data
4	RX Data
5	Ground
6	SCK Microcontroller Programming Line

SPECIFICATIONS

	7 Microcontroller Reset
Serial Port - Upper	8 Pin Auxiliary Serial Port:
	3 TX Data
	4 RX Data
	5 Ground
I^2C	5 volts peak-to-peak +/- 1 volt input
	5 volts DC +/- .2 volts 250 mA
	Ground 250 mA maximum sink

4.6.3 Manual Activation Switches:

QTY 8, activate with a hold time >0.50 seconds

4.6.4 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
RECEIVE LEVEL	3 stage LED bar graph

SPECIFICATIONS

4.6.5 Control Unit Connector Configuration

Connectors for 2005698-01 PCB

CONNECTOR DESIGNATION	PURPOSE
J2	Microphone jack
	1 kΩ input impedance, 50 mV$_{P-P}$ nominal input level.
JP1	microSD FLASH card holder
	1 NC
	2 Slave Select Not
	3 Master Out / Slave In
	4 Switched 3.3V power
	5 Serial Clock
	6 Ground
	7 Master In / Slave Out
	8 NC
JP4	Options Connector:
	1 microcontroller Input
	2 Ground
JP3	On-Board Receiver Module Connector Pins:
	1 Ground
	2 +8 VDC
	3 Clock
	4 Data
	5 Latch Enable
	6 Carrier Detect Not
	7 De-Emphasized Receive Audio
	8 Flat Receive Audio
JP4	SINAD Sensor Input Pins:
	1 Ground
	2 Sensor Input
JP5	Backplane
	48 pin EPT male card edge connector
JP6	600 Ohm Input Configuration Jumper Pins:
	2-3 600 Ohm audio in to receiver decoders
	1-2 Audio from 600 Ohm sent to Amps when 600 Ohm PTT is closed

SPECIFICATIONS

JP7   600 Ohm Output Configuration Jumper Pins:
  1-2   Output siren audio
  2-3   Output radio transmit audio

JP8   CTCSS Connector Pins:
  1   RX Audio in
  2   Ground
  3   8 VDC for CTCSS board
  4   Audio Switch
  5   TX CTCSS tone

JP9   Transceiver #1 VOX Jumper
  Jumpered to use VOX for Carrier Detect

JP10   Dual receiver priority jumper
Jumper "EXT" side to give external receiver #1 priority
Jumper "INT/EXT2" side to give on-board receiver or
 external receiver #2 priority.
Jumper neither side, first carrier detect has priority

JP11   Jumpered when SINAD option is used

JP12   Short to force Carrier Detect of External transceiver 1

JP13   External Transceiver Connector Pins
Upper and Lower:
  1   RX Audio in
   Receive audio level for 300 m V_{P-P} to 3
   V_{P-P} to make 1 V_{P-P} at TP16
  2   TX Audio out
   50 mV_{P-P} to 3 V_{P-P}
  3   Carrier Detect
   < 1 VDC for active
  4   PTT
   Active low, will sink 500 mA max.
  5,7   12 VDC for Radio
   +/- 0.2 Volts, 1.0 Amps max.
  6,8   Ground
   1.5 Amps max. Current capacity

SPECIFICATIONS

P1-Lower   8 Pin Serial Port:
    2   Digital Receive / Serial Port Not
    3   TX Data
    4   RX Data
    5   Ground
    6   SCK Microcontroller Programming Line
    7   Microcontroller Reset

P1-Upper   8 Pin Auxiliary Serial Port:
    3   TX Data
    4   RX Data
    5   GND

SPECIFICATIONS

4.7   Motherboard (2005320)

JP1 – Relay Output Control   1 A, 30 VDC
      1 - ground
      2 - switched 10 - 15 Volts   (Switches on when a function is active)

JP2 - Switched Radio Power Output   10 A, 30 VDC
      1 - ground
      2 - switched 10 - 15 Volts   (Switches on when control board is
                                                operating above low voltage cutoff point)

JP3 – 12VDC Power Input
      1 - ground
      2 - 11 - 15 Volts

JP4 – Audio Signal Output
      1 - ground
      2 - signal
      Output voltage Swing   >4.5 V Peak to Peak
      Maximum Load   2K Ohms
      Total Harmonic Distortion   < 10% w/ 1KHz Sine-wave

JP5 – Control Board Connection

JP6 – Sensor Inputs
     1. GND
     2. Activation Detect (SPR#1)
     3. GND
     4. Intrusion
     5. GND
     6. Solar
     7. GND
     8. AC
     9. GND
    10. PTT
    11. GND
    12. Spare (SPR#2)

SPECIFICATIONS

JP7 - Audio Channel Select Jumper
- Jumper pins 1 & 2 to select channel A
- Jumper pins 2 & 3 to select channel B

JP8 - Charger Sense Input
    1 - ground
    2 - charger input

Fuses
    (F1) Relay Coil at JP1   ATO, 1 A, 32 VDC

    (F2) 12 VDC Radio at JP2   ATO, 10 A, 32 VDC
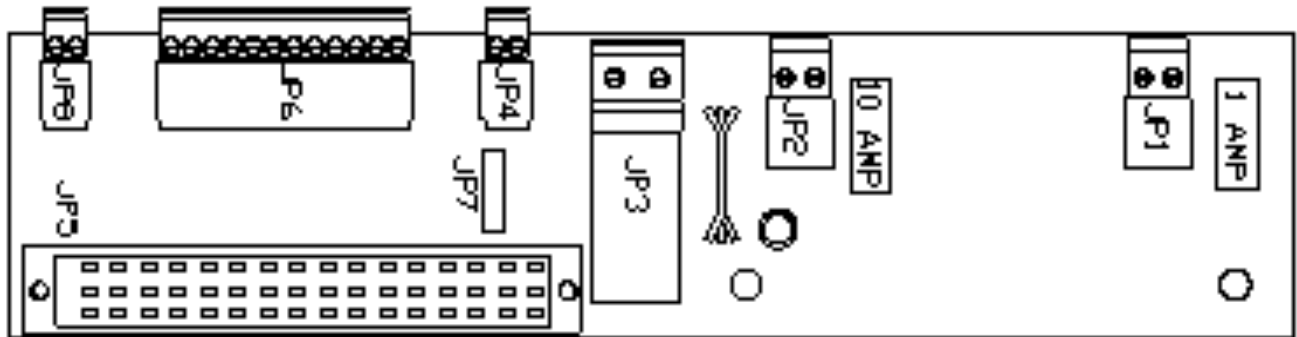
Figure 4.1 - Motherboard Outline Drawing

SPECIFICATIONS

4.8   Environmental

Operating Temperature	-13°F to 140°F / -25°C to +60°C
Humidity	0-98% non-condensing

Notes:
1. The UVRI can operate throughout this temperature range provided the battery temperature is maintained at -18°C or higher.
2. The UVRI housing carries a NEMA 4X / UL50 rating

4.9   Physical

Enclosure	16" x 15" x 8-3/8" (H x W x D) 40.64 cm x 38.1 cm x 21.27 cm
Weight	29.6 lb / 13.43 kg (including battery)

SPECIFICATIONS

5 UVRI OPERATION

5.1 Hardware General Description

All relay control, audio generation and remote communication functions are handled by a single microcontroller board. The back-plane (motherboard) contains connectors and terminal blocks for interconnection to other system components.

The UVRI receives remote control signals and responds to the Federal Commander remote monitoring system to provide live and recorded voice, warning tones, and a remote control relay contact output. The UVRI provides a contact closure to activate the remote system and provide an audio output at JP4 on the motherboard.

Operation is supervised and status information is transferred back to the control station(s) via one or more available communications networks. The UVRI monitors the audio output level and the Remote Activation input on the motherboard at JP6-2 to verify proper operation. Remote Fire Alarm and PA systems provide a contact closure across JP6-1 and JP6-2 to indicate proper operation.

The controller can be powered from 12VDC and/or 120 or 240 VAC.

5.2 Manual Activation

The manual activation switches located on the face of the controller 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
FUNC5 & FUNC7	Digital Transmit Deviation tone

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

5.3   Local Public Address

The operator has the ability to give local Public Address (PA) messages using the model MNC-MC microphone provided. PA mode can be entered simply by pressing the push-to-talk (PTT) button on the MIC while the MIC is plugged into the ¼" receptacle on the front panel. The PA LED will be lit anytime the PTT button on the microphone is pressed. The local PA volume level is set by adjusting the MIC GAIN knob located directly above the MIC jack.

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

5.4   Relay Output

A DPDT relay output is located in a socket at the bottom of the control cabinet. This relay closes whenever a alert tone, digital or live voice message is active and can be used to trigger remote devices.

5.5   Sensor Inputs

Terminal block JP6 on the motherboard accepts contact closure inputs. These inputs are activated by a short to "Common".

Sensor Connections

JP15 Terminal	Function
1	"Common"
2	Remote Activation "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"

5.5.1 Intrusion

Alerts the controller when one of the unit's doors has been opened.

5.5.2 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.

5.5.3 Spare#1

Remote system operation detect. Shorting this input verifies that the remote system is active.

5.5.4 Spare #2

Unused inputs for special functions.

5.5.5 AC Power

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

5.5.6 600 Ohm PTT

Puts the unit in Local PA mode for input of external audio. Closed is active

5.6 Two-Way Status Monitoring

The UVRI uses a variety of sensors in the UVRI Series Controller, which when equipped with a two-way radio, allows the remote unit to communicate its status back to the base station. This reduces station downtime by quickly alerting operating personnel to potential problems at remote units.
The following status points are monitored:
1. AC Power (AC sense relay)
2. Battery Voltage (built in)
3. Charger Operation (built in)
5. Signal A (built in)
6. Signal B (built in)
7. Remote System Operation (Motherboard JP6-1&2)
8. Intrusion

5.7   Quiet Test

This option enables acoustically quiet tests to be performed on the UVRI control and the remotely controlled devices. Quiet Test uses a 20 kHz tone to quietly test the tone generators and the remote amplifiers (if applicable). 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.

B.   Finding Faults

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.

5.8   DC Power Supply

A 13.5-16.5VDC (13.8VDC Nom.), 7A supply provides a constant voltage current limited charging system for the integrated 12V battery and power for peripheral equipment.

6 SYSTEM PLANNING

6.1 Control Unit

Select a suitable mounting location that is secure, and away from high voltage wiring and high power RF systems. The Control Unit can be mounted indoors or outdoors depending on what equipment it will be connected to as long as the unit is kept within the operating temperature limits.

Refer to the specification section to obtain the weight of the UVRI. Insure that the mounting surface and fasteners can safely sustain the weight of the assembly.

In order to reduce the possibility of introducing noise in the audio path, the controller should be placed as close as possible to the Fire Alarm or remote PA system.

The controller should be located out of the reach of vandals. The controller is supplied with padlock hasps that will accept user provided padlocks for security.

The UVRI requires a 120 VAC or 240 VAC 50-60 Hz power source to power the UVRI and charge the internal 12V battery.

Several methods can be used to activate the Control Unit. Plan how the UVRI will be connected to the antenna system or wired communications network.

If radio control is going to be used, consider RF coverage and antenna placement when selecting a suitable location.

7 INSTALLATION

WARNING

Read all Safety Notices at the beginning of this manual before installation.

This section contains reference drawings to assist with installation. A list of typical installation materials required may be obtained by reviewing the cabinet mounting details and the electrical installation material list below.

7.1 UVRI Controller Installation Reference Drawings
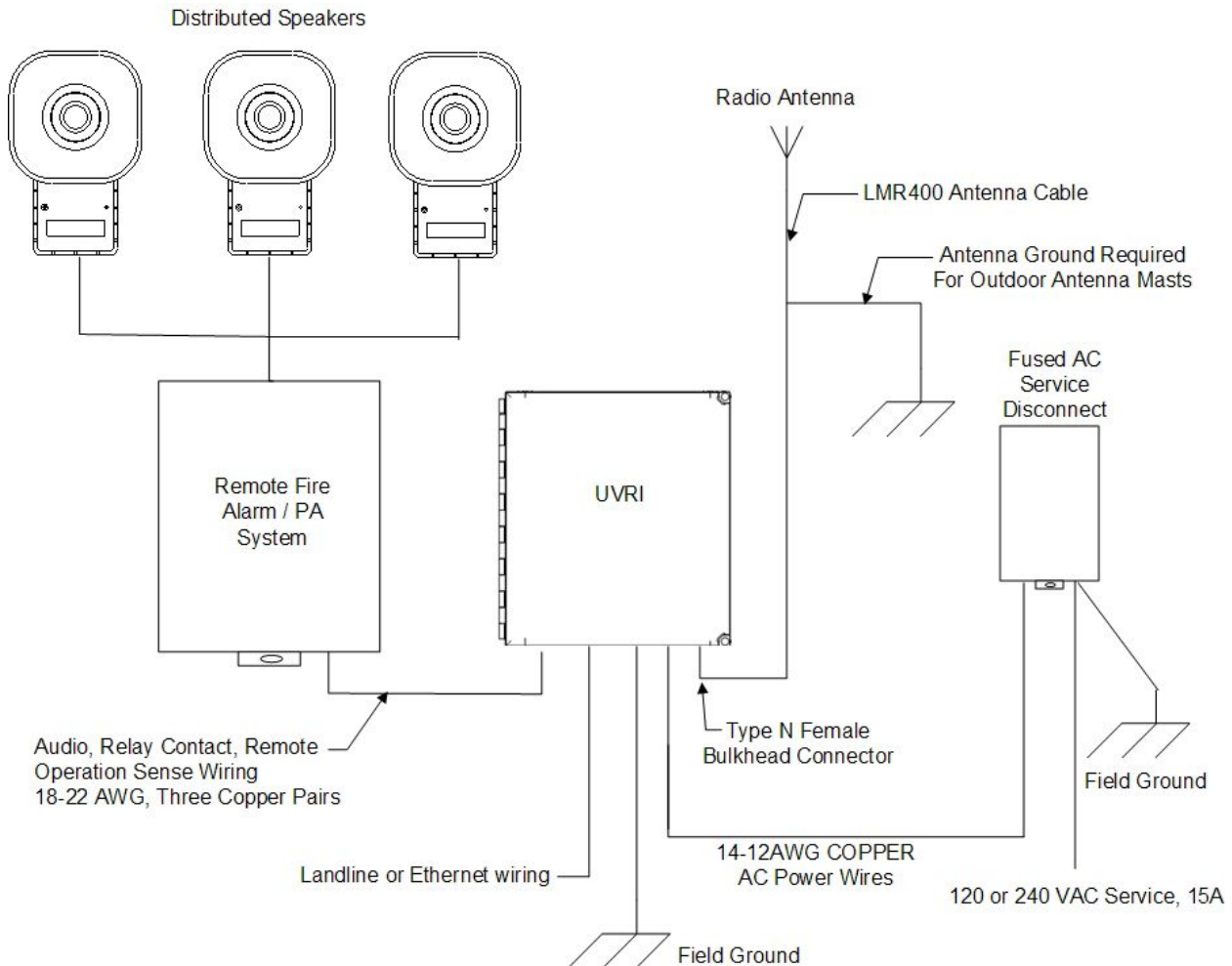
Figure 7.1 - Typical UVRI Installation Drawing
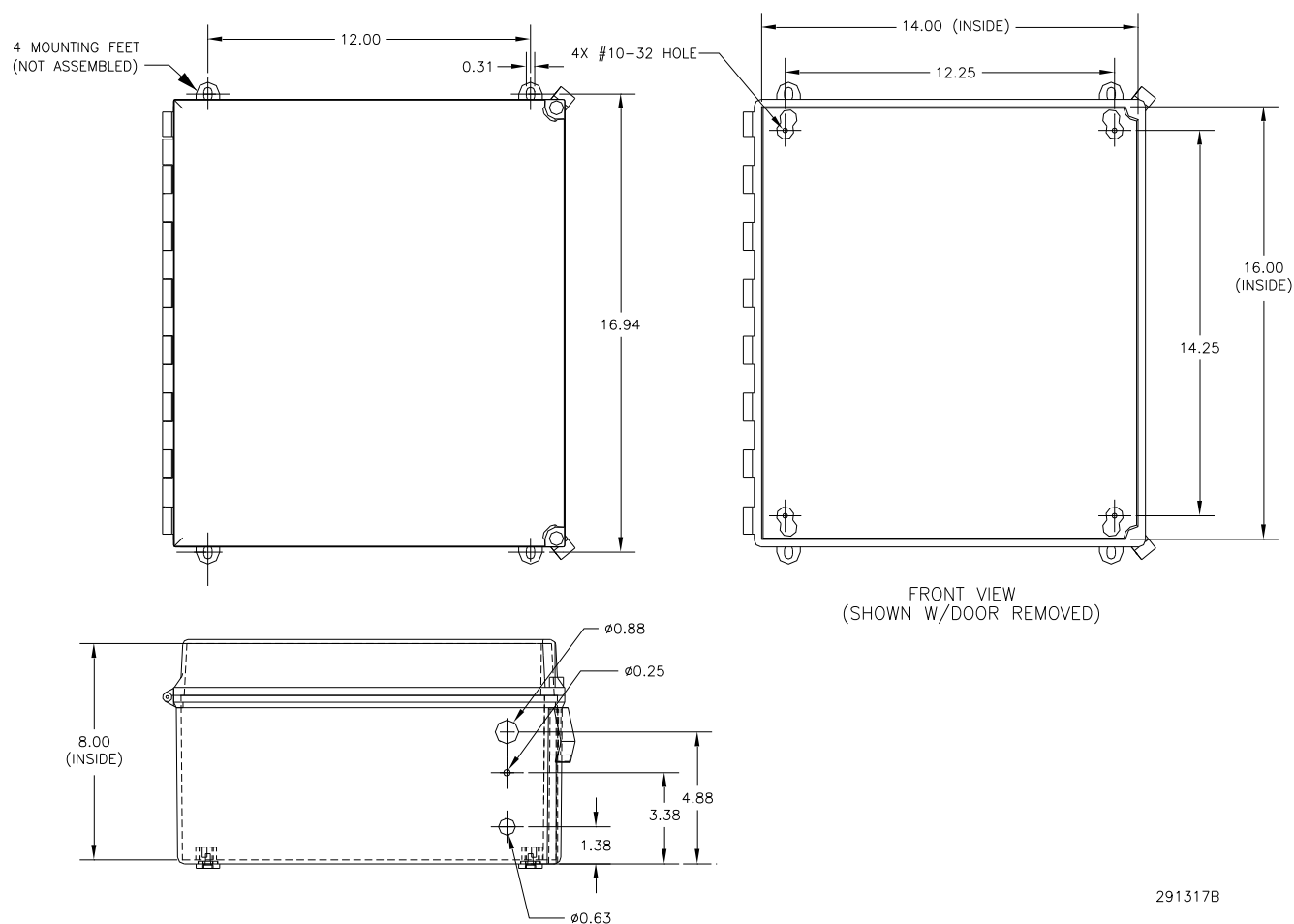
Figure 7.2 - UVRI Cabinet Dimensional Outline Drawing
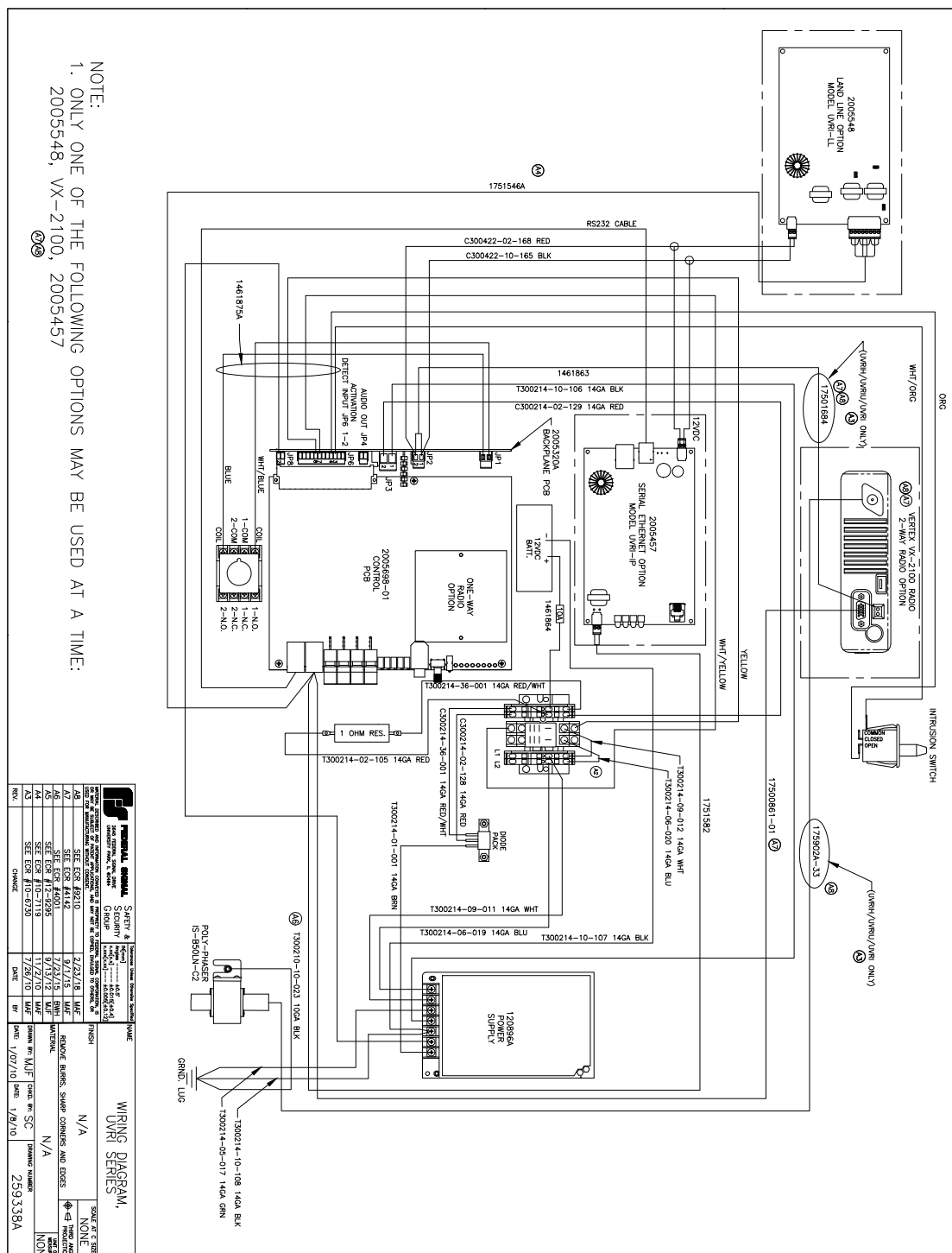
Figure 7.3 - UVRI Wiring Diagram

7.2   General Mounting Guidelines

These general installation instructions are pertinent to all installations. Specific mounting methods and required installation materials are described in the next section.

1. There are four cabinet mounting flanges available for bolting the UVRI to a flat surface, (see *Figure 7.2*).

2. The total weight of the UVRI is listed in the specifications section. It is imperative that the mounting surface and mounting method selected can safely sustain the weight of the assembly.

3. Prepare the mounting surface for hanging the cabinet by predetermining the location of the mounting holes. The cabinet should be attached to a wall or other substantial vertical surface using the four mounting flanges. Lag bolt the cabinet to the wall using the prepared holes and anchors.

4. If the UVRI model being installed has a 2-way radio, ensure the radio antenna cable is installed before applying power to the UVRI to avoid damaging the radio.

7.3   UVRI Installation Material List and Installation Guidelines

The following material lists and guidelines describe basic installation details required to install the UVRI cabinet. This list will vary depending on mounting methods, other options, local and national electrical codes, etc. Therefore, this list should be used as a reference guideline only.

Concrete or Filled Cement Block Wall Mounting Materials		
Material Description	**Purpose**	**Qty**
¼" x 2" Pin/Sleeve/ Lock Washer/Nut Style Anchors	Anchor Bolts	4

7.3.1 Concrete or Filled Cement Block Wall Mounting Guidelines:

1. Mark the mounting hole locations on the wall for the cabinet.
2. Install the anchor bolts for the four cabinet corners according to the manufacturer's instructions.
3. Mount the cabinet to the wall.
4. Proceed to following section.

Note: If wall is not straight, use shims to insure enclosure maintains square and structural integrity.

Hollow Block Wall Mounting Materials		
Material Description	**Purpose**	**Qty**
¼" x 2" Heavy Duty Toggle Bolts	Anchor Bolts	4

7.3.2 Hollow Block Wall Mounting Guidelines:

1. Mark the mounting hole locations on the wall for the cabinet.

2. Install the anchor bolts for the four cabinet corners according to the manufacturer's instructions.

3. Mount the cabinet to the wall.

4. Proceed to following section.

Wood Stud Wall Mounting Materials		
Material Description	Purpose	Qty
¼" x 1" Lag bolts	Backboard & cabinet mounting bolts	8
2' x 2' x ¾" B/C or better plywood	Mounting backboard	1
Construction adhesive	Mounting backboard attachment	1

7.3.3 Wood Stud Wall Mounting Guidelines:

1. Locate the wall studs for attaching the mounting backboard to the wall. The backboard should attach to at least two studs.

2. Mark the wall stud location on the mounting backboard and drill four pilot holes for the lag bolts.

3. Apply construction adhesive to the back of the mounting backboard.

4. Attach the mounting backboard to the wall with four lag bolts.

5. Locate the mounting position of the cabinet on the mounting backboard.

6. Drill pilot holes for the lag bolts.

7. Mount the cabinet to the mounting backboard.

8. Proceed to the following section.

Metal Stud Wall Mounting Materials		
Material Description	**Purpose**	**Qty**
¼" x 2" lag bolts	Cabinet mounting bolts	4
2' x ¾" x 2' B/C or better plywood	Mounting backboard	1
#14 x 2" metal stud screws	Backboard mounting	6
Construction adhesive	Backboard mounting	1

7.3.4 Metal Stud Wall Mounting Guidelines:

1. Locate the wall studs for attaching the Mounting Backboard to the wall.

2. Mark the wall stud location on the mounting backboard and drill pilot holes for the #14 metal stud screws. Three screws should be placed in each stud evenly spaced apart.

3. Apply construction adhesive to the back of the mounting backboard.

4. Attach the mounting backboard to the wall with #14 metal stud screws.

5. Locate the mounting position of the cabinet on the mounting backboard.

6. Drill pilot holes for the ¼" lag bolts.

7. Mount the cabinet to the mounting backboard.

8. Proceed to the following section.

7.4 Installer Supplied UVRI Electrical Installation Material List

Material Description	Purpose	Qty
30 amp/250V/ 2 Pole Solid Neutral/Fused Disconnect w/ Ground Kit/ NEMA 1 Rating/ Lockable Cover Tang/ Lockable Operator	Optional Electrical Disconnect	1
10A FRNR Fuse	Fuses For 120 V Service	1
5A FRNR Fuse	Fuses For 240 V Service	2
12 - 14 AWG White Wire	AC Neutral from disconnect	8'
12 - 14 AWG Black Wire	AC Load from disconnect	8'
12 - 14 AWG Green Wire	Equipment ground from disconnect	8'
1/2" Seal Tight Conduit & Fittings	Electrical conduit from disconnect and to Fire Panel/PA System	Varies
Metal Ground Bushings	Equipment ground connections	2
Screws, appropriate to mounting surface	Disconnect mounting	4
15 A Breaker	Service panel breaker serving unit	1
White Wire appropriately sized	AC neutral from breaker panel to disconnect	Varies
Black Wire appropriately sized	AC load from breaker panel to disconnect	Varies
Green Wire appropriately sized	Equipment ground from breaker panel to disconnect	Varies
Conduit & fittings, appropriately type and size for particular installation requirements	Electrical conduit from breaker panel to disconnect	Varies
6 AWG Stranded	Cabinet ground to earth ground for external antenna applications	Varies
18-26 AWG stranded wire pairs	Audio, Relay Output, and Remote System Operation Sense	Varies

7.5   Electrical Connections

Make all electrical connections in compliance with local electrical codes and NEC recommendations. Disconnect all power and read all warnings at the beginning of this manual and on the batteries before making connections.

7.5.1   Grounding Requirements

1. The UVRI cabinet must be properly connected to an earth ground. The cabinet contains an external ¼" ground stud for making this connection.
2. Externally installed antennas require a dedicated ground to either a ground rod or building steel _below_ grade in addition to the UVRI cabinet ground.

7.5.2   DIN Rail Terminal Blocks

These points provide a convenient location for making the AC power connections. A small screwdriver must be pushed into the square opening in the terminal block to open the contact of the block. With the wire inserted, the block will clamp the wire with a spring-loaded connection when the screwdriver is removed from the terminal block.

Each terminal block accepts bare 12-14 AWG wire. The terminal blocks are labeled L1 and L2.

7.5.3   120 VAC Electrical Service Wiring

1. Install a dedicated 15 A circuit breaker in an existing breaker panel or install a new breaker panel if necessary for the UVRI.

2. Install conduit from the breaker panel to the ½" conduit entrance in the bottom of the UVRI.

3. Route user-supplied 12-14 AWG wires (1 black, 1 white, 1 green) through the conduit from the UVRI Cabinet and the fused breaker panel.

4. Connect the white neutral wire from the breaker panel neutral to the DIN rail mounted terminal block labeled L1 in the UVRI control cabinet.

5. Connect the black line wire from the 15A breaker to the DIN rail mounted terminal block labeled L2 in the UVRI control cabinet.

6. Optionally, connect a green ground wire from the breaker panel earth ground to the green ground block in the UVRI cabinet or run a ground lead from the external 1/4" ground stud on the UVRI cabinet to earth ground.

7.5.4 240 VAC Electrical Service Wiring

1. Install a dedicated 2-pole 15A breaker in an existing breaker panel or install a new breaker panel if necessary for the UVRI.

2. Install conduit from the breaker panel to a conduit entrance in the bottom of the UVRI. Ensure the conduit is adequately grounded.

3. Route user-supplied 12-14 AWG wires (2 black, 1 green - optional) through the conduit from the UVRI Cabinet and the fused breaker panel (or as otherwise specified by code).

4. Connect one line wire from the 15A breaker panel to the DIN rail mounted terminal block labeled L1 in the UVRI control cabinet.

5. Connect the other line wire from the 15A breaker to the DIN rail mounted terminal block labeled L2 in the UVRI control cabinet.

6. Connect a green ground wire from the breaker panel earth ground to the green ground block in the UVRI cabinet or run a ground lead from the external 1/4" ground stud on the UVRI cabinet to earth ground.

7.5.5 DC Power Connection

The battery is located under the control board mounting plate and is pre-wired to the UVRI. Connect DC power to the UVRI by plugging in the two position power connector at JP3 on the motherboard as shown in figure 7.5.

7.5.6 Audio Output Connection

Connect the audio output of the UVRI to the audio input of the Remote Fire Alarm/PA System at JP4 on the motherboard as shown in figure 7.5 below. Adjust the Audio Output Level potentiometer to the desired output level. The pot is located next to the Audio Signal Output connector (JP4).

7.6   Remote System Sense Input

Connect the remote system sense contact closure to the UVRI to JP6 on the motherboard as shown in figure 7.5 below. This contact is used by the UVRI to report the operational status of the remote system
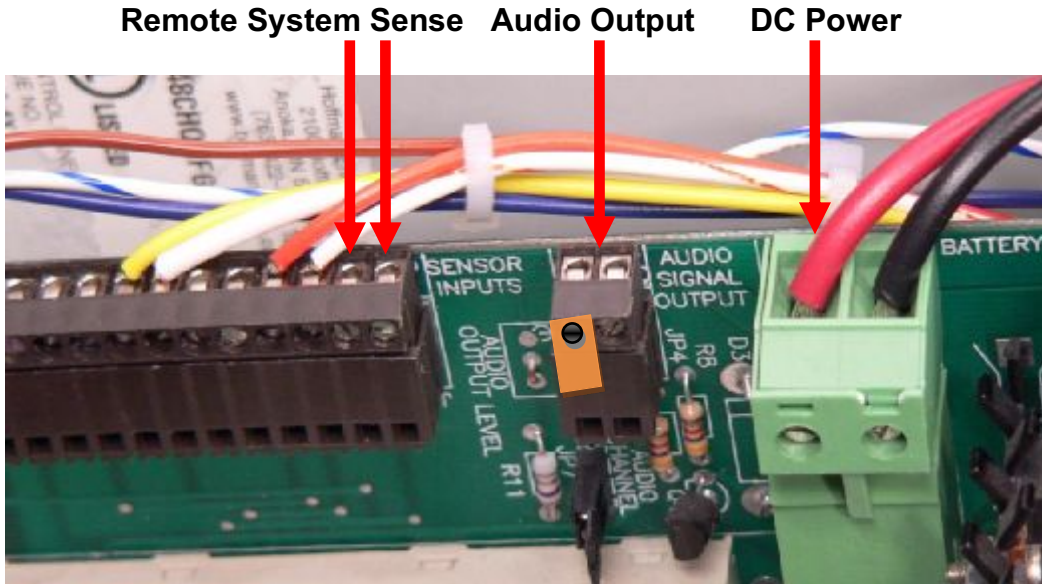
Figure 7.4 - UVRI Remote System Sense, Audio Output and DC Power Connections

7.6.1   Relay Output

The relay output is used to activate the remote Fire Alarm/PA System if a remote contact closure input is available in the remote system. The relay can also be used to control other remote devises such as strobe lights. Two sets of normally open and normally closed contacts are available as shown in the figure below.

Figure 7.5 - Relay Output

7.7   Landline Control Connection

If the UVRI-LL wireline control option is used, connect the telephone wire pair from the TB-LL base line driver to the Landline Interface module located in the control cabinet on top of the control board's protective metal cover. Refer to the Telco Interconnect System manual 255377 for further installation details.

7.8   Ethernet Connection

If the UVRI-IP Ethernet control option is used, the UVRI Ethernet module will be located in the control cabinet on top of the control board's protective metal cover. Make the Ethernet connection to J1 on the UVRI Ethernet module. Refer to the Serial to Ethernet User's Guide part number 2005457 for further connection details.

The UVRI requires an IEEE 802.3, 10 Base-T, half duplex connection and uses ports 16,887 (for Codespear TCP/IP) and port 80 (HTTP) for its configuration web page. Ethernet wire runs must be less than 328 feet from the nearest network switch.

7.9   Antenna Types

Determine type of antenna to be installed if a wireless RF system is used:
1. Cabinet Mounted Magnetic Base
2. Remote Mounted Magnetic Base
3. Yagi External Antenna Type
4. Omni external antenna Type

For installation instructions on the Yagi and Omni Antennas go to the Federal Signal's website.

7.10 Remote Mounted Magnetic Base Antenna Installation

A remote magnetic base antenna may be installed in buildings that a known good RF signal strength inside and a suitable location to mount the antenna.

1. Locate a suitable location for the antenna that is away from any electrical devices, high voltage and computer wiring. The location should be as high as possible and should enable the antenna mast to be at least 2 feet away from any grounded metal objects.

2. Mount the antenna to a flat, secure metal structure with at least 225 inches square area for the magnetic mount to stick to.

8   PRE-OPERATION CHECKOUT AND TEST

Warning

The following procedures should be performed by a properly trained technician to ensure the equipment is operating properly.

8.1   Visual Inspection

1. Fill out the <u>Field Test Data Sheet</u> at the end of this section to document the following inspections and tests. The completed document should be kept on file for future reference.
2. Verify all connections and fasteners are tight.
3. Ensure that all installation debris is removed from the cabinet.
4. Secure all wiring with wire-ties to provide strain relief and to neatly manage the wiring.
5. Verify the control board clock LED is blinking.
6. Verify the power supply LED is on.

8.2   Pre-Operation Checkout

1. Refer to *Figure 7.4.* Measure the DC voltage across the DC input connector on the control board. The voltage must be at least 11.5 VDC to turn on the control board. The voltage should be 13.7VDC when AC power is applied to the UVRI.

2. All alert signals and voice messages should be tested at this time. Verify that the correct audio is heard at the proper volume for each function. The Audio A, Audio B, and ARM LEDs should light during each function.

8.3   Radio Transceiver Adjustment Procedure

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

A. Qualifications:

Requires a properly trained Radio Technician.

B. Equipment Required:

1. Service Monitor
2. Oscilloscope

C. Setup:

Connect the radio to the service monitor.

D. Receive Audio Adjustment

1. Using service monitor, 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. (If using private line, add 0.75 kHz private line deviation to the signal.)

2. Adjust the level at TP16 (2005698 controller card) for $1V_{p-p}$ using the REC gain adjustment R105 (2005698 controller card front panel).

E. Transmit Deviation Adjustment

1. Simultaneously press buttons 5 & 7 on the 2005698 controller card. This will cause the controller to transmit for approximately 8 seconds.

2. Measure the deviation level using service monitor.

3. Adjust the TX level (2005698 controller card front panel) for 3 kHz deviation. If the bandwidth is 12.5 kHz, then adjust for 1.5 kHz deviation (If using private line, add 0.75 kHz private line deviation to the signal.)

Note, slightly higher S/N levels can be obtained by increasing the RF modulation levels to 4 and 2 kHz depending on the channel spacing and the ability of the radio to produce a clean sinewave at these levels without limiting. Do not exceed these deviation levels. All sites in the system should be set to the same modulation level.

8.4   Control and Status Monitoring

1. Use The Commander Digital System (SFCDWARE) to verify the UVRI has been properly configured for the application. Make any required changes prior to placing the UVRI into service.

2. The control and status monitoring features should be tested from each control point. Test each control function and all status indications using SFCDWARE. Verify each status point provides the proper indication of both pass and fail conditions.

UVRI Field Test Data		
Customer:	Project Number:	Date:
Contact Person:	Phone:	Second Phone:
Radio Shop:	Contact:	Phone:

Siren Type:	S/N:	Voltage:
Controller Type:	Antenna: Omni ☐ Yagi ☐ Cabinet Mounted ☐ External Mounted ☐	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: Vac	Battery voltage:	Charger voltage:	

Battery Type:	Model:	Manufacturer:

Sensor	State	Sensor / Output	State
Intrusion Sensor	Pass ☐ Fail ☐	Audio A/B Sense	Pass ☐ Fail ☐
Low Battery	Pass ☐ Fail ☐	Remote System Operation	Pass ☐ Fail ☐
AC Power On	Pass ☐ Fail ☐	Relay Output	Pass ☐ Fail ☐
AC Power Off	Pass ☐ Fail ☐	Audio Output	Pass ☐ Fail ☐
Charger Sense	Pass ☐ Fail ☐		

Wiring Neatly Dressed in Cabinet: Yes ☐ No ☐	**Debris removed from Control Cabinet:** Yes ☐ No ☐
Antenna connectors sealed: Yes ☐ No ☐ (Required for outdoor antenna installations)	
Tested by:	Date:
Notes:	

Figure 8.1 - Field Test Data Sheet

9   MAINTENANCE

WARNING

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

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

If you are experiencing any difficulties, contact Federal Signal Customer Care at: 800-548-7229 or 708-534-3400 extension 5822 or Technical Support at: 800-524-3021 or 708-534-3400 extension 7329 or through e-mail at: techsupport@fedsig.com. For instruction manuals and information on related products, visit: http://www.fedsig.com/

Test the UVRI 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 UVRI and verifies that it remains ready for use when needed; it also instills confidence in the reliability of the system.

In order to minimize the potential for a failure, annual inspection and maintenance is recommended.

GENERAL MAINENANCE

9.1.1 Signal Operational Check

1. Activate each of the signals from the control point and observe the signal indicators on the control module and the remote PA system. Verify each function sounds the correct signal at the proper volume level for the application.

2. Verify that the system status is reported correctly at the control point. Check each status point to verify both pass and fail conditions are correctly reported. Verify that the relay output closes with each function activated.

9.1.2 Battery Inspection

1. Remove AC power and measure the DC voltage across the DC input connector on the control board. This voltage should be above 12.75 VDC if the battery has been charging for at least 24 hours.

2. The battery will typically need to be replaced every 3-5 years depending on the application environment. The battery life will be diminished if it is left in a discharged state for prolonged periods.

3. 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, or replace if necessary.

9.1.3 Battery Replacement

Remove all electrical connections from the motherboard before removing the battery. Remove the connectors at JP1, JP2, JP3, JP4, JP6, and JP8 on the motherboard.

The battery is located under the control board mounting plate. The control board mounting plate can be removed by loosening the four screws as shown below.
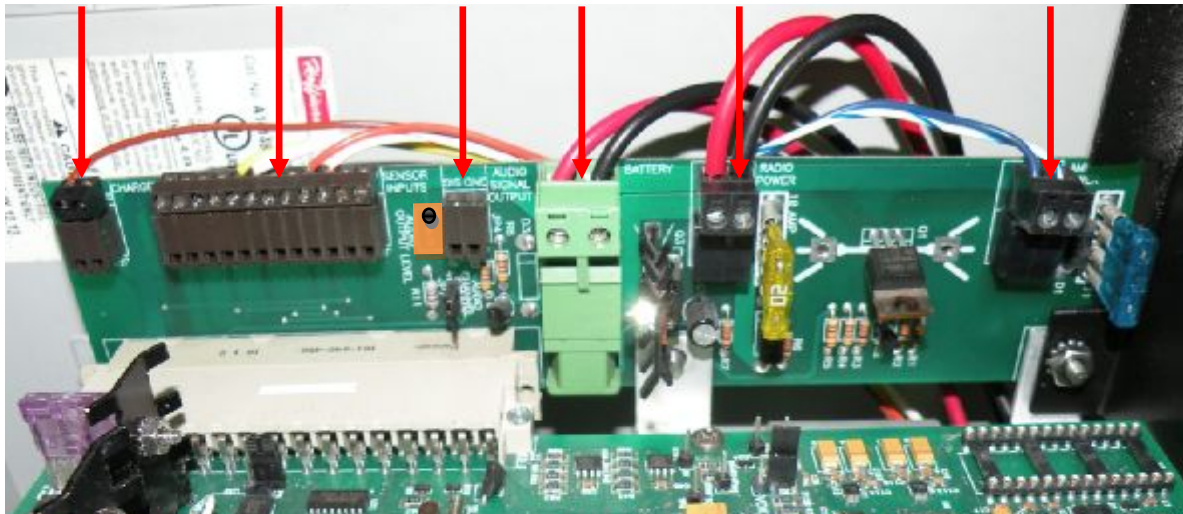
Figure 9.1 - UVRI Motherboard Connections

Figure 9.2 - UVRI Battery Location and Cover Plate Mounting Screws

9.2   Troubleshooting

	PROBLEM	ACTION
1.	NO RADIO DECODE	A. 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.	LOW OUTPUT FROM SPEAKERS	Check battery voltage. Also, check signal indicators on amplifiers during a function. If indicators are off, remove amplifier for service.
3.	FUNCTION STOPS BEFORE NORMAL TIME-OUT	Batteries may require further charging. Check battery voltage under load. Check charger output.
4.	LOCAL P.A. FEEDS BACK	Lower P.A. volume using knob above MIC connector.
5.	LOCAL P.A. HAS LITTLE OR NO OUTPUT	Hold MIC close to mouth. Increase PA volume using knob above MIC connector.
6.	BATTERIES NOT HOLDING CHARGE	Check that charger fuses are intact and check charger output. Test batteries.
7.	RELAY OUTPUT ON MOTHERBOARD DOESN'T OPERATE	Check that the relay on the system motherboard is operating (indicated by LED D2). Also check fuse F1 on motherboard (20 amp slo-blow)
8.	RADIO P.A. TAKES TOO LONG TO TIME OUT	Check radio for proper operation of squelch. CD LED should light while carrier is present.
9.	LANDLINE ACTIVATION INPUTS DO NOT FUNCTION	Verify minimum 1- second contact closure is applied to JP14 on the motherboard.

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

10 OPTIONS

10.1 Radio Control

The UVRI can be activated by a radio signal when the optional radio transceiver is incorporated into the Control Unit. Activation by radio control has the advantage that control lines are not required between the control site and the UVRI. Federal Signal offers the controller with a full line of transceivers built in which cover the VHF and UHF bands.

10.2 Digital Voice Recording

Four minutes of digital voice storage is provided as a standard feature with the UVRI. When the Digital Voice Recording option (model DVR) is purchased, the UVRI will be factory programmed with high quality voice or music recordings as specified by the customer.

Up to 250 individual messages may be programmed into the UVRI. Digital Voice Messages may be activated remotely or via the control panel switches. To program activation codes with Digital Voice Messages under them, follow the instructions in the Commander Digital System manual. It is possible to assign codes to the functions DIG VOICE 1 through DIG VOICE 250. As in all sounding functions, the unit must first be sent the ARM command followed by one of the six DIG VOICE commands to activate the stored message. The only adjustment available on the Digital Voice PCB is a potentiometer, which adjusts the audio output level.

10.3 Installation of User Supplied Radio Receivers

CAUTION
Improper installation of radio control equipment may cause the Alert and Notification system 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, 300mV - 10V$_{p-p}$
2. Transmit Audio, 50mV - 3V$_{p-p}$
3. Carrier Detect - active low
4. PTT
5. +8 VDC
6. GND
7. +8 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 +8 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 UVRI 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 300 mV – 3V$_{p-p}$ unclipped.

2. The Transmit Audio Output is adjustable from 50 mV - 3V$_{p-p}$.

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 P.A. function eliminating the need to broadcast the cancel tones over the speakers.

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

5. RX and TX Audio – Adjust the RX and TX Audio levels as described in Section 6.

10.4 Model UVRI-IP

The UVRI-IP combines the characteristics of a UVRI with Serial to Ethernet conversion capabilities. 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

Ethernet 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
10.4.1
Input Voltage   10.5 – 95 VDC
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 Adjustable from 0.30 to 3.00 V_{p-p},
(-17 dB to +2.7 dB) into 600 Ohms

*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 Procedure for Communications'.

Connectors

> **JP1   600 Ohm Audio Output Port**
> Balanced line output
>
> **JP2   JTAG Emulation port**
>
> **JP3   Audio Output Expanded or
>   Flat Selection Jumper**
> Jumper pins 1 & 2 for flat audio output
> Jumper 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   10.5-95 VDC 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 Temp.   -30 °C - +65 °C
Humidity   0- 95% non-condensing

Physical

Dimensions   about (H x W x L) 2" x 4" x 6.5"

Weight   < 2 lb
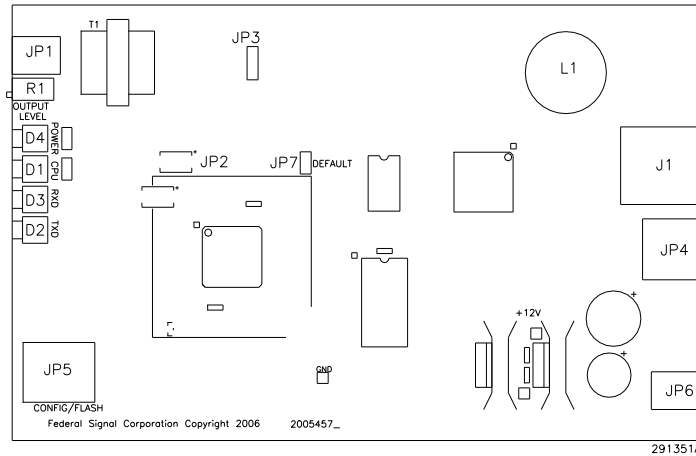
Serial to Ethernet Board

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 priority level

Bandwidth Requirements

Voice Over IP: 150K baud per Connection

Siren Activation: 50 bytes per connection

Siren Poll Response: 74 bytes per connection

11 Final Assembly Drawing and Parts List

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	103441	RES, WIREWND, 10 Ohm, 50W, 1%	1
2	115812	DIODE, SCHOTTKY, 80A, 30V	1
3	120896	TRANSFORMER, POWER SUPPLY, 15VDC, 7A	1
4	122378A	SWITCH, INTRUSION, SPDT	1
5	131290-01	RELAY, 120VAC, 15A	1
6	131292	RELAY, 12V,10A	1
7	138182A	SOCKET,RELAY,8 PIN	1
8	138212	IC SOCKET, TYCO, 8 PIN	1
9	139491-03	CONN, 3 POS,BLZ 5.08	1
10	150A109	MISC ELEC, CABLE TIE, SELF LOCKING	1
11	150A130	MISC ELEC, CABLE TIE MOUNT	1
12	155193A	BATTERY	1
13	1611511	LABEL, FEDERAL SIGNAL	1
14	1611639B-01	LABEL,WARNING, HIGH VOLTAGE	1
15	1612403A	LABEL, GRND. SYMBOL	1
16	1612546A	LABEL, WARNING, BATTERY	1
17	1613057	LABEL,RELAY COIL	1
18	1613058	LABEL,RELAY,OUTPUT	1
19	1613059	LABEL, CONTROL, UVRI	1
20	1613060	LABEL, CONTROL, LED, UVRI	1
21	1613062A	LABEL,WARNING,AC VOLTAGE	1
22	1613066	LABEL,MODEL UVRI	1
23	161693A	LABEL,FS LOGO	1
24	170347A	ENCLOSURE, FIBERGLASS, UVRI	1
26	2005240 (1-way radio)	PCB,1-WAY RADIO (SEE TABLE)	1
27	2005320-05	PCBA, UVRIU ADAPTER, STAND ALONE	1
28	2005457	PCBA, SERIAL TO ETHERNET CONVERTER	1
29	2005698-01	PCBA,UV+ CONTROLLER	1
30	229218A	BRKT,T.BLOCK END	2
31	229282A	TERM BLOCK,1-POLE,35MM DIN	4
32	229283A	CAP,END,TERM BLK,1 P.	2
33	230286A	STUD/STANDOFF, HEX, 6-32, NYLON,	2
34	255385	MANUAL, UVRI	1
35	259338	WIRING DIA., UVRI	0
36	288691A-03	ANTENNA,LIGHTNING PROT,POLYPHASER	1
37	288810A-03	DIN RAIL ALUM UNCOATED 3" LENGTH	1
38	7000A345-16	SCREW,MACH,HEX HD,1/4-20 X 1"	1
39	7000A404-08	SCREW, MACH, PAN HD., PHILLIPS, 6-32	5
40	7000A404-16	SCREW, MACH, 6-32, PAN HD, PHIL, STEEL, ZINC CHR	2
41	7000427-04	SCREW, MACH., PAN HEAD, PHILLIPS, 6-32	2
42	7000427-06	SCREW, MACH., PAN HEAD, PHILLIPS, 6-32	4
43	7000A428-10	SCREW, MACH, 8-32, PAN HD, PHIL, SS,	7
44	7000A444A-05	SCREW,MACH,PHIL,4-40 X 5/16	9
45	7000A455-06	SCREW, MACH, 10-32, TRS HD, SLOT, SS,	4
46	7011A152-06	#8 SHT.MTL.SCREW,S.S.	2
47	7058A045	NUT, KEPS, SS, 8-32	1
48	7058A047	NUT, MACH SCR, KEPS,10-32	2
49	7058050A	NUT,MACH SCR,KEPS,1/4-20	2
50	7058053A	NUT, KEPS, 4-40, , SS,	6
51	7072024	WASHER, FLT, 1/4, 11/16 OD, 0.078"/0.049" THK, SS,	2
52	7072148	WASHER, FLT, .250 ID, .625 OD, 0.093" THK, NEOPRENE,	1
53	7074077A	WASHER, SPLT, M4, 7.55mm OD, 0.8mm THK,	4
54	7075A002	WASHER,EXT TTH, #8, OD,0.02" THK,STL,TRIV CHROM	2
55	7099219A	RIVET, BLND, , 5/32 DIA HD, ALUM,	2
56	8009021A	BRACKET, POLYPHASER	1
57	8009030A	CATCH,SNAP-ACTION	1
58	8609101	BACKPLATE ASSY, UVRI	1
59	8609104-01	CHASSIS ASSY, PCB	1
60	8609108	BRKT, RADIO MT, LEFT	1
61	8609108-01	BRKT, RADIO MT, RIGHT	1
62	8609115	BRKT, INTRUSION SWITCH	1
63	8609117-01	DOOR ASSY., PCB COVER	1
64	8609118	COVER ASSY., PCB	1
65	85001560	TEST PROC.,UVRI	1
66	r42-02-13	NEOPRENE SPONGE,1/8" X 1/2" X 8" LG.	1
67	r42-02-13	NEOPRENE SPONGE,1/8" X 1/2" X 2" LG.	2
68	T300210-10-023	TWIRE (SEE WIRING DIAGRAM)	1
69	139285-03	CONN, RECPT, .100 CENTERS (JP6, UVRI-IP ONLY)	1
70	C300422-09-143	C-WIRE, BLK (JP6, POS. 1 & POS. 3, UVRI-IP ONLY)	1

DETAIL K

INSERT RIVETS FROM DIRECTION SHOWN

SECTION A-A

COVER HOLE WITH TAPE

NOTE: OMIT RADIO AND MTG. BRACKETS ON UVRI-IP & UVRI-LL MODELS

RADIO

SECTION E-E

NUT FROM 142212A

WARNING HIGH VOLTAGE

DETAIL B

SECTION D-D

SECTION C-C

NOTE: REPLACE POLYPHASER WITH 231208 HOLE PLUG ON UVRI-IP & UVRI-LL MODELS

NOTE: REFER TO WIRING DIAGRAM NO. 259338 FOR WIRING PART NO'S.

MODEL NO.	RADIO/PCB PART NO.	DESCRIPTION
UVRIH	19901665-02	VHF,VX-2100
UVRIU	19901665-06	UHF,VX-2100
UVRI	N/A	NO RADIO MODEL
UVRI-LL	2005548	PCB, LAND LINE
UVRI-IP	2005457	PCB,SERIAL ETHERNET

REV	CHANGE	DATE	BY
C5	SEE ECR #9210	2/23/18	MAF
C4	SEE ECR #6903	1/17/17	MAF
C3	SEE ECR #6702	12/14/16	MAF
C2	SEE ECR #6103	9/7/16	MAF
C1	SEE ECR #6104	8/18/16	MAF
C0	SEE ECR #4142	9/1/15	MAF

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

FINISH: N/A

MATERIAL: N/A

REMOVE BURRS, SHARP CORNERS AND EDGES

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

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DRAWN BY: MJF CHKD. BY: SC SCALE AT D SIZE:
DATE: 1/20/10 DATE: 1/21/10 NONE
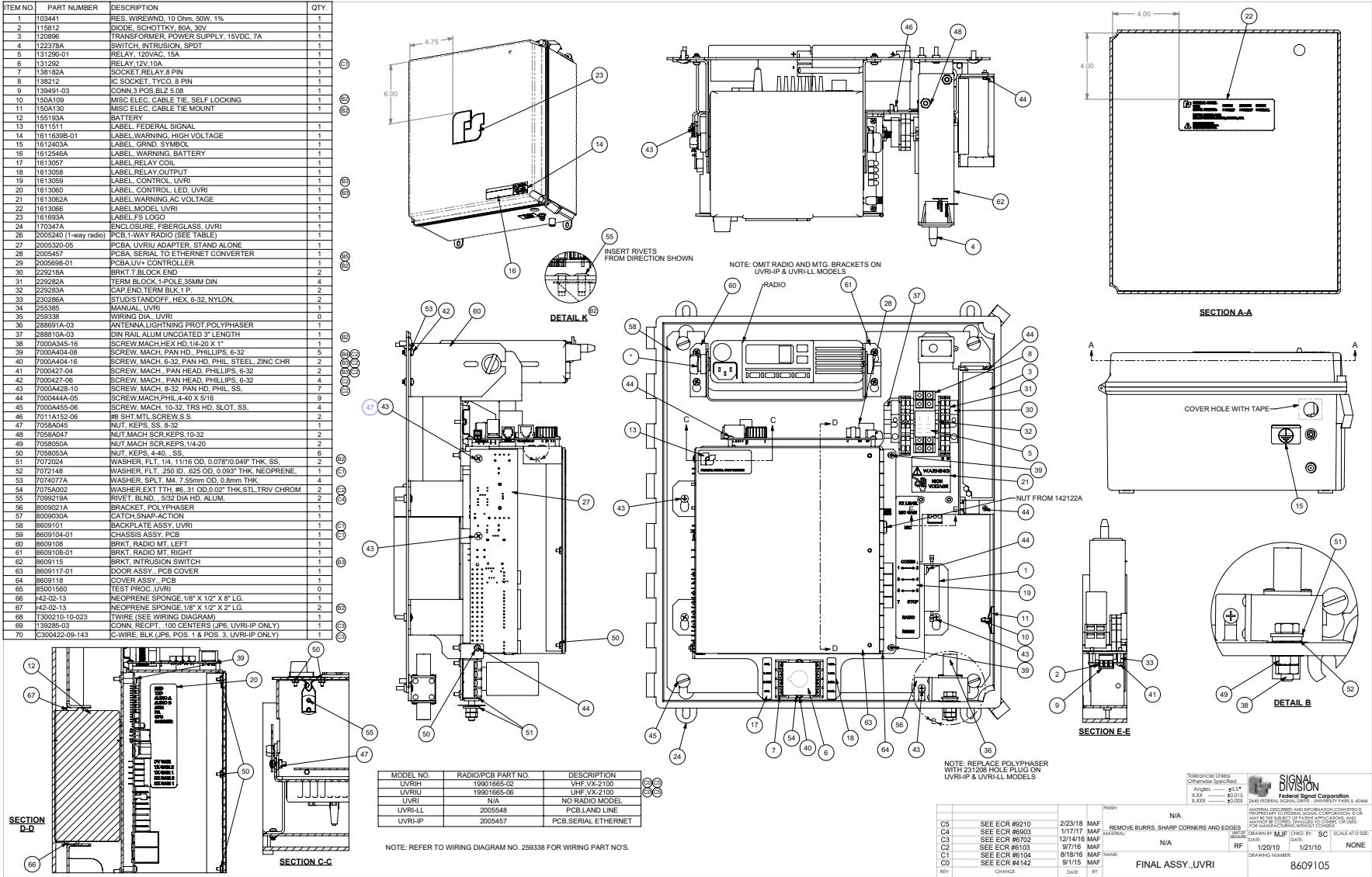
UNIT OF MEASURE: RF

NAME: FINAL ASSY.,UVRI

DRAWING NUMBER: 8609105

Figure 11.1 - UVRI Final Assembly and Parts List