

Exhibit B

Description of Circuit Functions and Device Operation
Sec. 2.1033(b)(4)

Following is a general description of the RVLU and its various components including the 2.4 GHz wireless LAN and antenna. Also included are block diagrams demonstrating how the RVLU's components are organized and integrated. More detailed information on the 2.4 GHz wireless LAN component, a Proxim RangeLAN2, is included in Exhibit G.

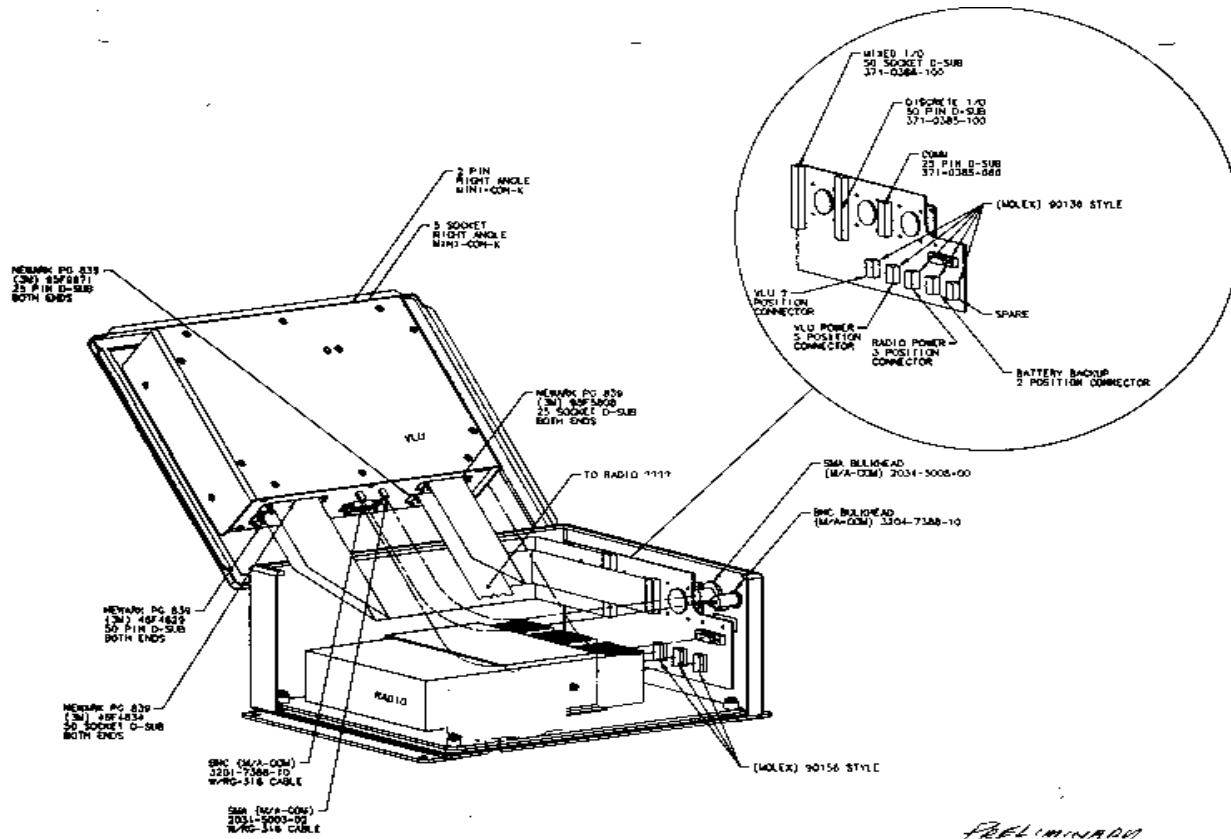
Mobile System

- **R/VLU - Contents**

- Case
 - NEMA 4
- Connectors
 - Power
 - Interfaces
 - Video
- RF connectors
 - GPS: SMA
 - RADIO: MINU UHF
 - WLAN: TNC
- PA
 - 2 channels 12W continuous, separate disable lines
- Chassis Interface
 - Vehicle Configuration (Chassis ID)
 - 2048 x 8 of non-volatile storage

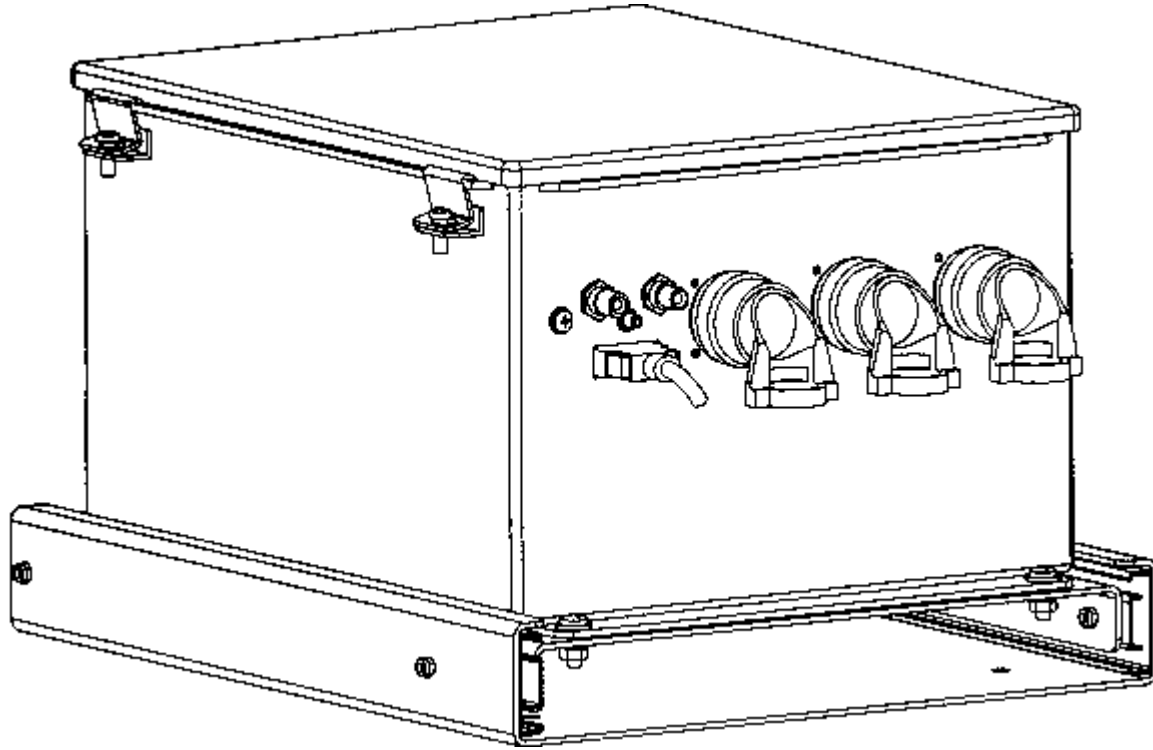
Mobile System

- R/VLU

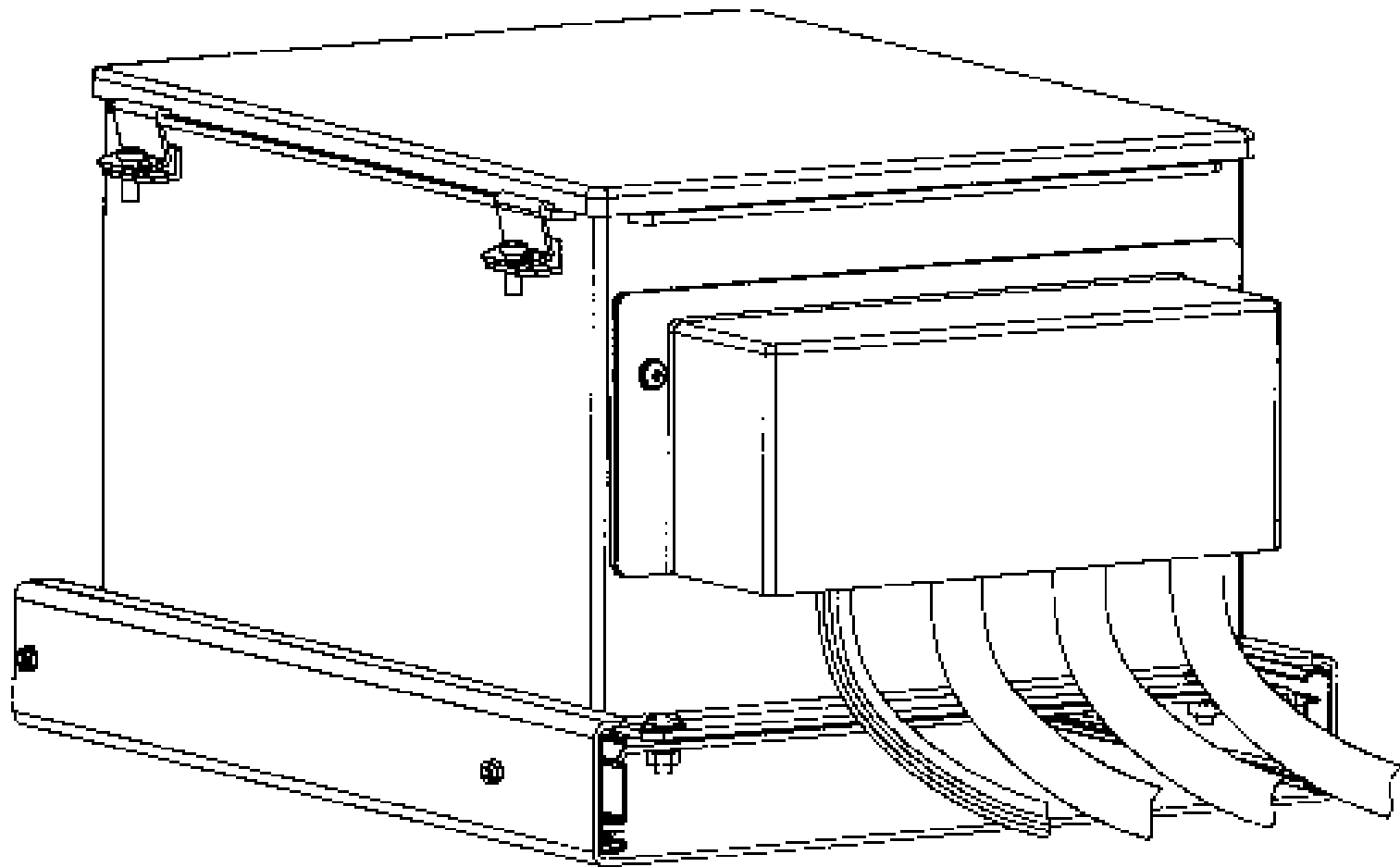


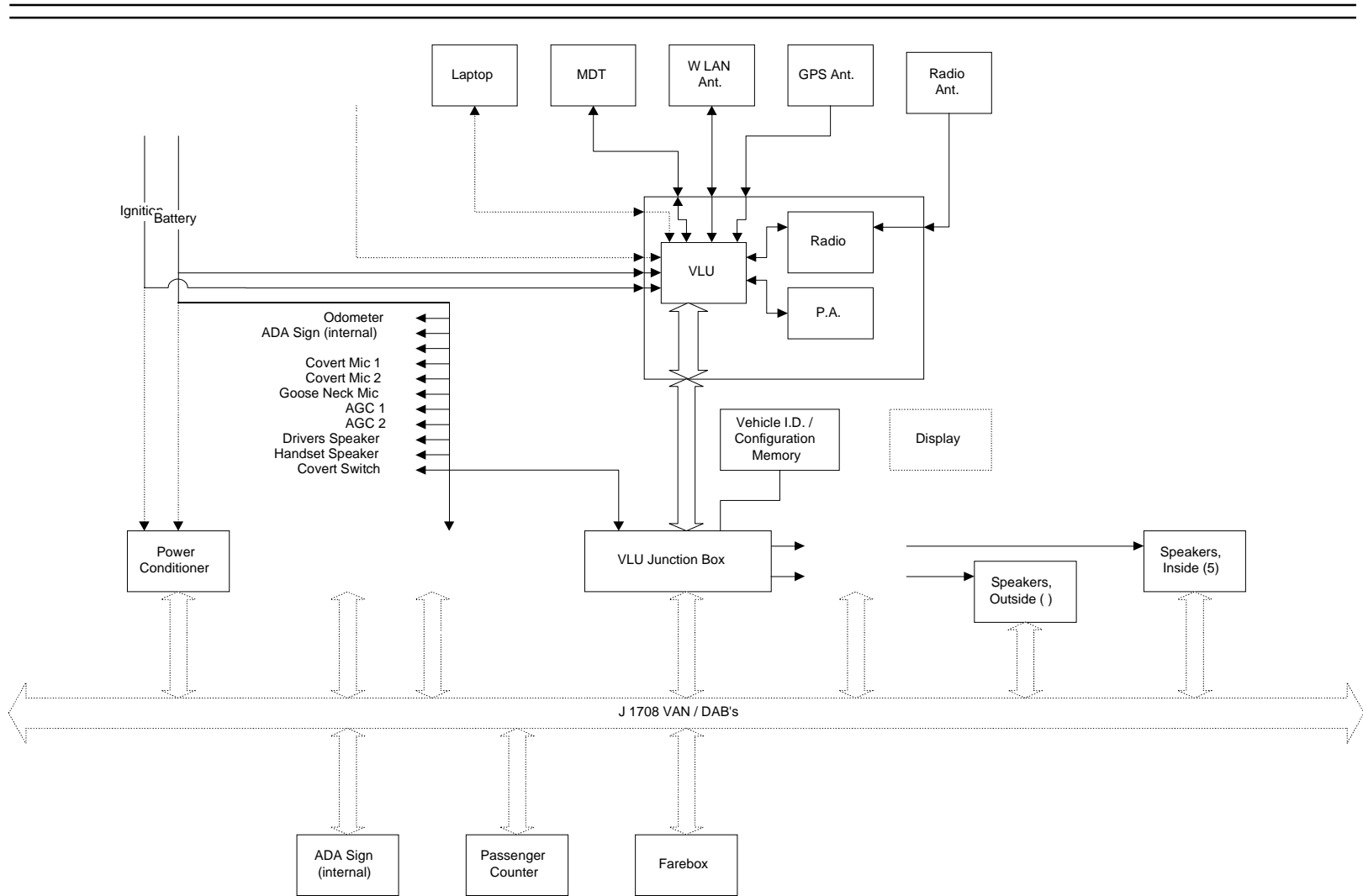
PRELIMINARY
 REVISED DRAWING - VIA
 8-28-98

Mobile System



Mobile System





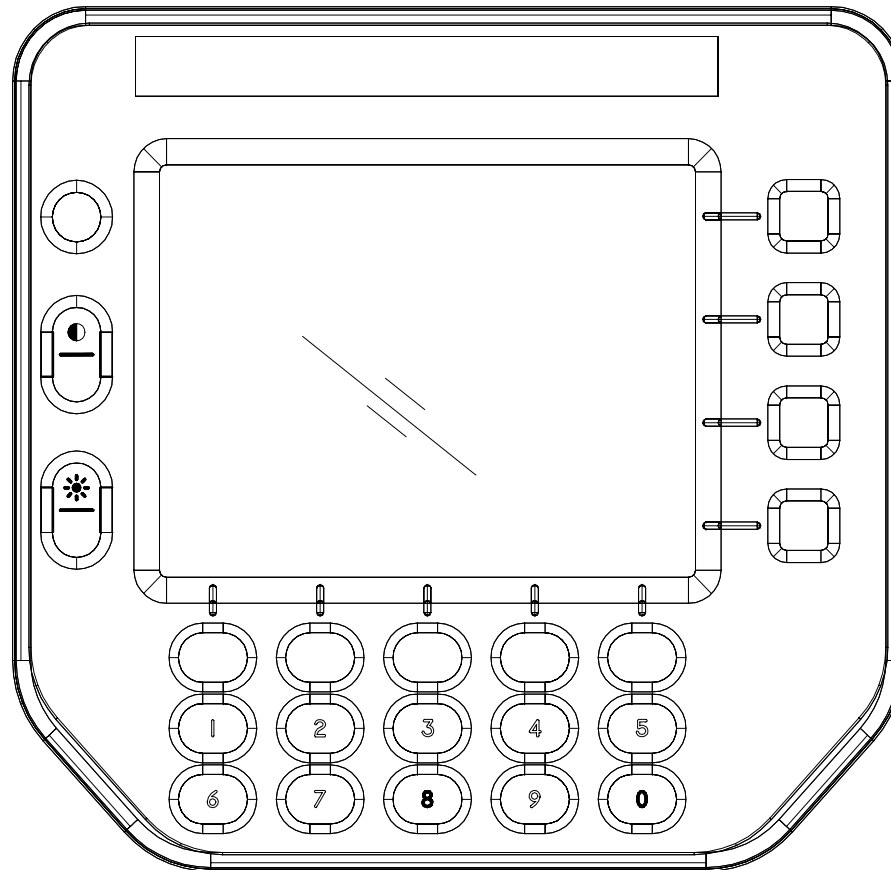
Mobile System

- **MDT**
 - Display
 - **1/4 VGA Monochrome (320 x 240 pixels)**
 - **Transflective for easy visibility in sunlight**
 - Keypad
 - **5 primary soft keys**
 - **Numeric keys (0-9)**
 - **Dedicated brightness and contrast controls**
 - **Scrolling control keys (soft keys)**
 - **Dedicated overt emergency key**
 - Interface
 - **Video - LVDS**
 - **Keyboard - RS232**



Mobile System

- MDT



Mobile System

- **VLU HARDWARE**



- Physical Size: 2.5” tall x 10.5” wide x 7.5” deep
- Processor: AMD 486DX-5-133 MHz
- Environmental
 - Temperature: -30 to +60°C operating
 - -40 to +80°C storage
 - Vibration: 2.95g RMS operational
 - 30g shock
 - Humidity: MIL_STD_810D, method 507.2, procedure2
 - EMI: FCC Part 15, subpart J, Class A
 - ESD: 4000V human model

Mobile System

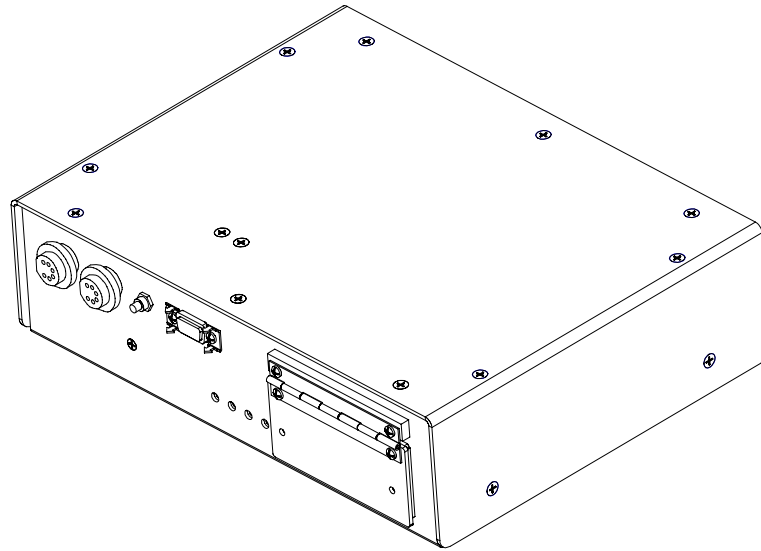
- **VLU HARDWARE**

- Data Storage
 - 2M Flash PROM
 - 4M EDO DRAM, (expandable to 16M)
 - 40M Removable Compact Flash (fixed route vehicles)
- Data I/O
 - 2 J1708 serial interfaces
 - 4 RS232 interfaces
 - 3 A/D isolated inputs
 - 16 Discrete isolated inputs
 - 16 Discrete FET isolated outputs
- Radio Interface
 - MDX voice/data
 - Emergency switch function in voice fallback mode
 - Up to 9600 baud GMSK RF Modem
- Audio Management



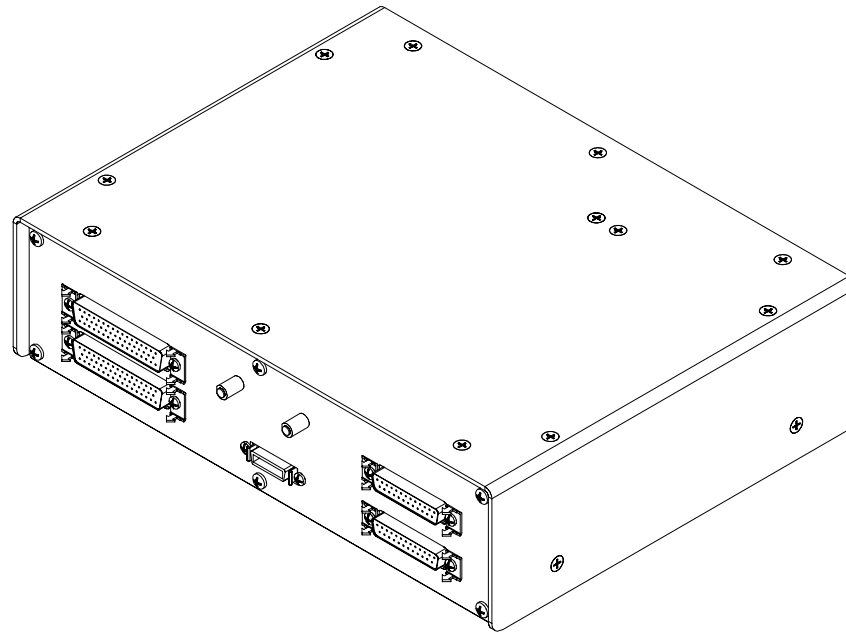
Mobile System

- VLU (front)



Mobile System

- VLU (rear)



Mobile System

- **Power Management**

- MDT power control
- Radio power control
- Audio and display driver circuitry power down
- CPU sleep mode (powers down GPS and associated circuitry)

Mobile System

- **Programming / Diagnostic Port**
 - unit reprogramming
 - file download / upload
 - debug and statistic information
 - test equipment interface

Mobile System

- **J1708 System**

- Power Filtering

- **Pre-filtered switched and unswitched J1708 power**

- Vehicle Area Network

- **VLU Internal Messaging**

- Time and Date
 - Vehicle Location
 - Door Open / Closure (High Impedance FET inputs)
 - Run Switch
 - Vehicle Use
 - Covert Switch closure
 - Unit Number (Power Unit)

- **External Devices**

- Passenger Counter (Red Pines)
 - Fare Collection System(GFI)
 - Video Surveillance (Prima Fascia)
 - Annunciator Signs (Sunrise single line)

Mobile System

- **J1708**

- **Software Structure**

- Internal VLU software tasks can register to receive messages from specific MIDs or containing specific PIDs.
 - This allows easy addition of new J1708 tasks at software compile time.

- J1708 Messaging

- New J1708 tasks must be integrated into the RF network structure at compile time
 - Many J1708 devices tie into existing messages

Mobile System

- **Wireless LAN**

- From Dispatch

- Schedules
 - Annuciation Data
 - Mobile Software Updates
 - System Configuration

- From Mobile

- Statistics
 - Messages unable to be delivered over the RF link

- Wake Up Mode

- Query from dispatch will “Wake Up” Mobile system
 - Need definition of J1708 alarms to “Wake Up” Mobile system.

DISCADOO™ — The Only Thing Funny About This Low-Visibility Antenna is Its Name!

The new **DISCADOO™** was designed for federal and local law enforcement applications and is now available to the general public. This exceptional antenna features a patent pending internal design that utilizes a classic planar-f style radiator to yield the lowest profile NMO antenna in history!

The phenomenal **DISCADOO™** housing lends itself to a variety of mounting situations, and is available in 800 MHz Cellular, 800 MHz trunking, 900 MHz and PCS frequencies.

ANTENEX® DISCADOO™ antennas are available with our industry standard NMO style mounting socket or with connector pigtailed utilizing a self-adhesive mounting strip for various applications. This design allows for bottom or side exit of the cable.

The **DISCADOO™** can be painted with nonmetallic paint to match any car or to mount in a building, on walls or ceilings.



Upgrade an existing installation!

Discadoo™ NMO style, bottom and profile



The **Discadoo™** can be painted to match your car's color with any nonmetallic paint. The magnetic base version is shown.



The NMO style **Discadoo™** is designed to be mounted on a car for mobile communication applications.

Technical Data - Product Features & Information

- **Frequency Range:** 806-866 MHz, 824-896 MHz, 890-960 MHz
- **VSWR:** <2.0:1
- **Maximum Power:** 100 watts
- **Impedance:** 50 ohms, DC Continuity
- **Mounts to:** Any clean, flat surface or NMO type mount.
- **Mounting Base:** Adhesive, Magnetic or NMO
- **Radiator:** Brass radiator
- **Contact:** Female TNC
- **Cable:** 24" RG316



The **Discadoo™** can be adjusted for bottom or side path for the cable

Discadoo Pigtail Style. Inset Top: Bottom Pigtail
Inset Bottom: Side Pigtail

Features & Advantages

CHOICES: Available in pigtail, NMO mounting and magnetic. Also available in ground plane and no ground plane versions.

LOWEST PROFILE: The NMO version has the lowest profile, less than 1" high, of any NMO disk in the industry.

FOAM SEAL: Closed foam friction seal prevents NMO mounted models from unscrewing under vibration and compensates for the car's curvature.

MINIATURE COAX: Pig-tailed versions have RG316 miniature coax to aid headliner mounting. Custom lengths available upon request. Coax length does not have to be tuned.

ELEMENT DESIGN: Special feed and element design yields antennas that are cross polarized to -5 dB for superior immunity to fading.

DIELECTRIC PRISM: Built in prism gives the ground plane mounted antennas a main lobe radiation angle of 20 degrees, optimum for mobile radio applications.

SYMMETRICAL RADIATION PATTERNS: NMO mounted antennas have a radiation pattern symmetrical to +/- 1/2 dB.

ABS HOUSINGS: Extra thick ABS plastic housing resists vandalism and delivers total car wash immunity.

AIR-DIELECTRIC: Air-dielectric is used for high "Q" construction.

SELF-ADHESIVE MOUNTING STYLE: This modern miracle is a permanent mount. It will not fall off!

MAGNETIC BASE STYLE: A magnetic pad built into base for quick or temporary installations.

Ordering Guide - Clear, Easy & Sensible!

DISC806P = **DISCADOO™** Antenna Model, 806-866 MHz, Pigtail

DISC	Antenna Style	DISCADOO™ Low-Profile Saucer Style Antenna
806	Frequency	Frequency component of part number in bold below: 806-866 824-896 890-960 U.S. and International patents pending. 1850-1970 2130-2200 2400-2500
P	Mount	M = Standard NMO Mounting Socket P = Pigtail Model with Self Adhesive Base with Female TNC G = Magnetic Base
Blank	Plane	Blank = Normal Model N = NGP - No Ground Plane Model

Model	Frequency	User	<\$300	\$300- \$1000	>\$1000
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3/4" NMO MOUNT MODELS

Ground Plane

DISC806M	806-866 MHz	92.25	44.28	42.44	40.59
DISC824M	824-896 MHz	92.25	44.28	42.44	40.59
DISC890M	890-960 MHz	92.25	44.28	42.44	40.59
DISC1850M	1850-1970 MHz	92.25	44.28	42.44	40.59
DISC2130M	2130-2200 MHz	92.25	44.28	42.44	40.59
DISC2400M	2400-2500 MHz	92.25	44.28	42.44	40.59

No Ground Plane

DISC806MN	806-866 MHz	97.45	46.78	44.83	42.88
DISC824MN	824-896 MHz	97.45	46.78	44.83	42.88
DISC890MN	890-960 MHz	97.45	46.78	44.83	42.88
DISC1850MN	1850-1970 MHz	97.45	46.78	44.83	42.88
DISC2130MN	2130-2200 MHz	97.45	46.78	44.83	42.88
DISC2400MN	2400-2500 MHz	97.45	46.78	44.83	42.88

SELF ADHESIVE MODELS WITH PIGTAILS

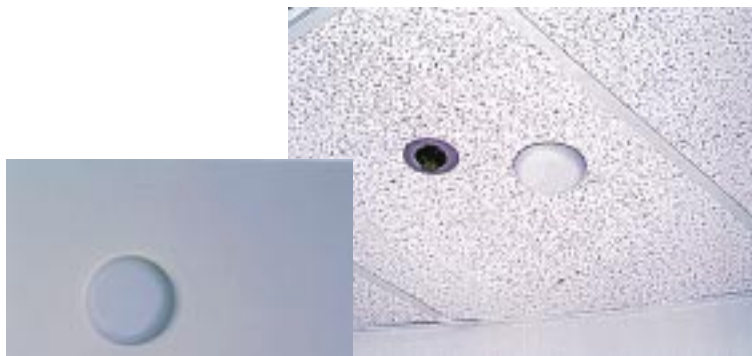
Ground Plane

DISC806P	806-866 MHz	83.23	39.95	38.29	36.62
DISC824P	824-896 MHz	83.23	39.95	38.29	36.62
DISC890P	890-960 MHz	83.23	39.95	38.29	36.62
DISC1850P	1850-1970 MHz	83.23	39.95	38.29	36.62
DISC2130P	2130-2200 MHz	83.23	39.95	38.29	36.62
DISC2400P	2400-2500 MHz	83.23	39.95	38.29	36.62

No Ground Plane

DISC806PN	806-866 MHz	88.23	42.35	40.59	38.82
DISC824PN	824-896 MHz	88.23	42.35	40.59	38.82
DISC890PN	890-960 MHz	88.23	42.35	40.59	38.82
DISC1850PN	1850-1970 MHz	88.23	42.35	40.59	38.82
DISC2130PN	2130-2200 MHz	88.23	42.35	40.59	38.82
DISC2400PN	2400-2500 MHz	88.23	42.35	40.59	38.82

Pigtail standard coax cable length is 2 ft of RG316 with a TNC female connector installed.



The **Disendoo™** can be painted and mounted on walls or on ceilings for data communications. While its radiation pattern has been improved for mobile operation, it is still suitable for indoor and wall mounted operation and its low visibility is ideal for commercial buildings and offices.

Model	Connector Style	Frequency	User	<\$300	\$300- \$1000	>\$1000
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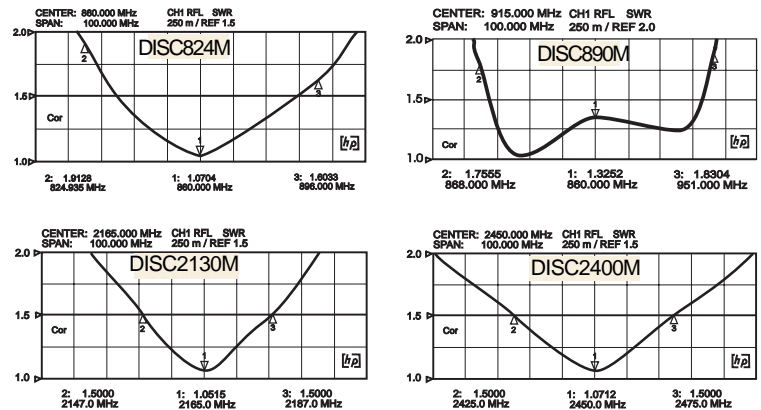
MAGNETIC MOUNT MODELS

Ground Plane

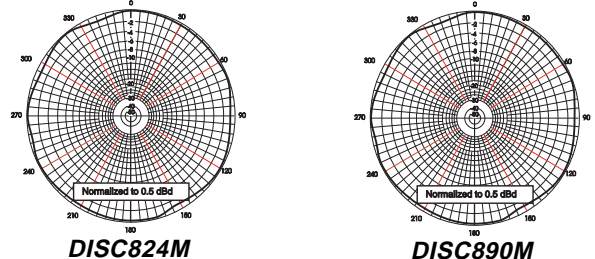
DISC806GB	BNC	806-866 MHz	87.23	41.87	40.13	38.38
DISC806GM	MCX	806-866 MHz	89.23	42.83	41.05	39.26
DISC806GSA	SMA	806-866 MHz	87.23	41.87	40.13	38.38
DISC806GSB	SMB	806-866 MHz	89.23	42.83	41.05	39.26
DISC806GT	TNC	806-866 MHz	87.23	41.87	40.13	38.38
DISC824GB	BNC	824-896 MHz	87.23	41.87	40.13	38.38
DISC824GM	MCX	824-896 MHz	89.23	42.83	41.05	39.26
DISC824GSA	SMA	824-896 MHz	87.23	41.87	40.13	38.38
DISC824GSB	SMB	824-896 MHz	89.23	42.83	41.05	39.26
DISC824GT	TNC	824-896 MHz	87.23	41.87	40.13	38.38
DISC890GB	BNC	890-960 MHz	87.23	41.87	40.13	38.38
DISC890GM	MCX	890-960 MHz	89.23	42.83	41.05	39.26
DISC890GSA	SMA	890-960 MHz	87.23	41.87	40.13	38.38
DISC890GSB	SMB	890-960 MHz	89.23	42.83	41.05	39.26
DISC890GT	TNC	890-960 MHz	87.23	41.87	40.13	38.38
DISC1850GB	BNC	1850-1970 MHz	87.23	41.87	40.13	38.38
DISC1850GM	MCX	1850-1970 MHz	89.23	42.83	41.05	39.26
DISC1850GSA	SMA	1850-1970 MHz	87.23	41.87	40.13	38.38
DISC1850GSB	SMB	1850-1970 MHz	89.23	42.83	41.05	39.26
DISC1850GT	TNC	1850-1970 MHz	87.23	41.87	40.13	38.38
DISC2130GB	BNC	2130-2200 MHz	87.23	41.87	40.13	38.38
DISC2130GM	MCX	2130-2200 MHz	89.23	42.83	41.05	39.26
DISC2130GSA	SMA	2130-2200 MHz	87.23	41.87	40.13	38.38
DISC2130GSB	SMB	2130-2200 MHz	89.23	42.83	41.05	39.26
DISC2130GT	TNC	2130-2200 MHz	87.23	41.87	40.13	38.38
DISC2400GB	BNC	2400-2500 MHz	87.23	41.87	40.13	38.38
DISC2400GM	MCX	2400-2500 MHz	89.23	42.83	41.05	39.26
DISC2400GSA	SMA	2400-2500 MHz	87.23	41.87	40.13	38.38
DISC2400GSB	SMB	2400-2500 MHz	89.23	42.83	41.05	39.26
DISC2400GT	TNC	2400-2500 MHz	87.23	41.87	40.13	38.38

"Your value added service has made the difference in a competitive market. When coupled with a quality product, the decision for antenna products is made simple." -- Jim, Team One Communications

VSWR



Horizontal Field Pattern



Mobile System

- **Positioning System**

- 12 Channel GPS Receiver
- Differential Correction sent over RF data link and applied at the Vehicle
- Odometer Backup
 - **Odometers installed on all revenue vehicles**
 - **Odometer auto-calibration**
 - **Odometer valid flag**
- Positioning error estimate
 - **position valid flag**
 - **figure of merit**

- **Time**

- GPS time used
- Time obtained from dispatch at power up (Used until GPS time is valid)
- No Invalid time displayed
- Selectable 12/24 hour format
- Time error estimate
 - **4 states (invalid, not currently set, dispatch set, GPS time)**

Mobile System

- **ANNUNCIATOR**

- Inside Audio Announcements
 - **Next two stops announced**
 - **Manual override control**
 - **Audio recordings to be provided by VIA**
- Outside Audio Announcements
 - **At arrival**
 - **X seconds before scheduled departure**
- Signage
 - **Internal single line**

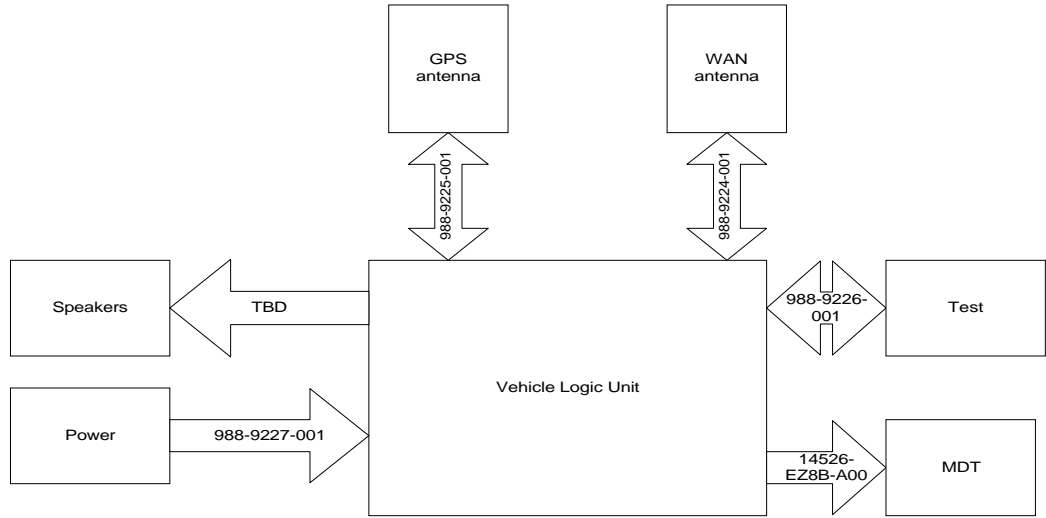
Storage requirements / sizing

Mobile System

- **DATABASES:**

- Route Files
- Transfer Files
- Canned Messages
- Configuration
- Annunciator audio data
- Annunciator text data
- Annunciator map files

VEHICLE LOGIC UNIT



RADIO VEHICLE LOGIC UNIT

