



Field Modification FM22005A

VS1 - Replacing UG69* and NAPS41* with UG132 and NAPS57A

Issue 1.0 18 May 2023

Nautel Limited

10089 Peggy's Cove Road,
Hackett's Cove, NS, Canada B3Z 3J4
T.877 6 nautel (628835) or +1.902.823.2233
F.+1.902.823.3183 info@nautel.com

U.S. customers please contact:

Nautel Inc.

201 Target Industrial Circle, Bangor ME 04401
T.877 6 nautel (628835) or +1.207.947.8200
F.+1.207.947.3693 info@nautel.com

e-mail: support@nautel.com

www.nautel.com

FM22005A – VS1 - Replacing UG69* and NAPS41* with UG132 and NAPS57A

FIELD MODIFICATION

1 INTRODUCTION

This document provides instructions for customers to replace the UG69* Power Supply and NAPS41* Power Supply Distribution PWB with a UG132 Power Supply and NAPS57A Power Supply Distribution PWB in a VS1 transmitter.

1.1 Reason for Modification

The UG69* Power Supply is no longer available. This modification allows the customer to use a UG132 Power supply in its place.

NOTE

The NAPS41 Power Supply Distribution PWB is not compatible with the UG132 Power Supply. The NAPS41* is replaced with NAPS57A.*

1.2 Equipment Affected

This procedure applies to all VS1 transmitters with UG69* Power Supply and NAPS41* Power Distribution PWB.

Once upgraded the VS1 transmitter will require VS SW 5.3.1 or later.

1.3 Responsibility for Implementation of Procedure

This modification is written for qualified transmitter maintenance personnel who are familiar with the VS1 transmitter.

1.4 Scheduling

Implement this modification at the convenience of station maintenance personnel. The transmitter must be turned off during this procedure.

1.5 Manpower Requirements

Replacing the UG69* Power Supply and NAPS41* Power Distribution PWB requires 1 hour to complete.

1.6 Special Tools/Test Equipment

You will need the following tools and test equipment:

- Standard # 1 and # 2 Phillips screwdrivers
- 5.5 mm Nutdriver
- Torque screwdriver (capable of 20 inch-pounds)
- Side cutters
- Isopropyl Alcohol



1.7 Material Required

The parts required for this modification are contained in the provided Field Modification kit (Nautel Part # 211-5111-01, see Table 1).

Table 1: Field Mod Kit, VS1, UG69 to UG132 Upgrade (Nautel Part # 211-5111-01)

Item	Qty	Component	Part #/Description
2	1	211-5163	QR Code Sheet
3	1	211-5313	Power Supply Spacer
4	1	UG132	Power Supply, 18-53Vdc, 47A, 2250W/1200W, 90-265Vac, CC
5	1	NAPS57A	Power Supply Distribution PWB, VS1 (UG132)
6	1	211-9587	Jig, Power Supply Spacer, VS1
7	1	211-5311	Front Support Bracket
8	1	211-5312	Rear Support Bracket
9	5	HT77	Tyrap, 0.098 W x 3.9 lg, Black, Heat Stabilized, 115C
10	1	211-5316	Hardware Kit
11	2	HMP61	Pillar, M3x0.5x45mm lg, 6mm Hex, Aluminum

Throughout this procedure, all hardware is retained for re-use whenever possible. The Hardware Kit, noted above, contains all hardware (plus additional spares) for use in this Field Modification.

1.8 Publications Affected

The +7-53 Vdc Power Supply (U2) has been changed from Nautel part # UG69* to UG132. The Power Supply Distribution PWB (A2) has been changed from Nautel part # NAPS41* to NAPS57A. These changes affect the technical documentation, particularly the following sections of the VS1 Troubleshooting Manual:

- Section 3 – Parts Lists, VS Family Tree (Figure 3.1):
 - Replace the NAPS41* part number reference in the A2 block with NAPS57A
 - Replace the UG69* part number reference in the U2 block with UG132.
- Section 5 – Electrical Schematics - In Table 5-1, replace the NAPS41* reference with NAPS57A. Replacement Electrical Schematics SD-1, SD-3a and SD-3b are provided with this document. Print and add/replace these schematics in the VS1 Troubleshooting Manual.
- Section 6 – Mechanical Drawings - In Table 6-1, replace the NAPS41* reference with NAPS57A. Replacement Mechanical Drawing MD-4 is provided with this document. Print and add/replace these schematics in the VS1 Troubleshooting Manual.

The power supply module has changed from UG69* to UG132. The front panel interface for the power supply module differs as shown in Table 2.



Table 2: Power Supply Interface

FRONT PANEL ITEM	UG69* (OLD PS MODULE)	UG132 (NEW PS MODULE)
AC OK LED 	LED is green when the supply's ac input is greater than 175 V ac. LED is off when the supply's ac input is less than 175 V ac.	LED is green when the supply's ac input is greater than 175 V ac. LED is off when the supply's ac input is less than 90 V ac.
DC OK LED 	LED is green when the supply's dc output is within operational limits. LED is off when the supply's output is outside operational limits or inhibited.	Same operation as UG69*.
SERVICE LED 	Not applicable	Power Supply is experiencing a thermal alarm (5 °C before shutdown) or thermal shutdown condition.
FAULT LED 	Not applicable	Power Supply is experiencing an internal/communication fault such as: thermal shutdown or defective fan, blown Ac fuse or over-voltage shutdown.

1.9 Identification of Modified Assemblies/Parts

Identifying modified assemblies informs future maintainers of the current configuration. Mark the transmitter with “FM22005A” next to the serial number label using indelible ink to indicate it has been modified.

2 UG69*POWER SUPPLY/NAPS41*POWER SUPPLY DISTRIBUTION PWB REMOVAL

- Set the transmitter to an RF off state.
- Switch off ac power to the transmitter using the switch on the rear panel of the transmitter.
- Unplug all connections from the transmitter, remove the transmitter from its cabinet and place it on a suitable workbench.

Refer to Figure 1 and Mechanical Drawings MD-1 and MD-4 in Section 6 of the VS1's Troubleshooting manual for reference.

2A Power Supply Removal

- Remove the VS1's top cover and retain hardware.
- Remove the securing bracket from the front of the Power Supply module (U2) by removing the two M3 screws. Discard bracket and hardware.
- Slide the Power Supply module toward the front of the transmitter to disengage it from its mating connector.
- Remove the Power Supply from the transmitter and discard as per local electronics waste management policies (if applicable).



2B Power Supply Distribution PWB Removal

- (a) Disconnect ribbon cables W2P2 and W4P2 and quick-disconnects P7 and P8 from the Power Supply Distribution PWB (A2). Note destinations for future connections.
- (b) Remove the nine wires (#10, 11, 12, 13, 14, 16, 18, 20 and 22) connected to terminals E3 and E5 and terminal blocks TB1 and TB2. Note destinations for future connections.
- (c) Use a 5.5 mm nutdriver to remove the six M3 nuts, split and flat washers that secure the Power Supply Distribution PWB to the transmitter. Discard PWB as per local electronics waste management policies (if applicable). Retain hardware for re-installation.

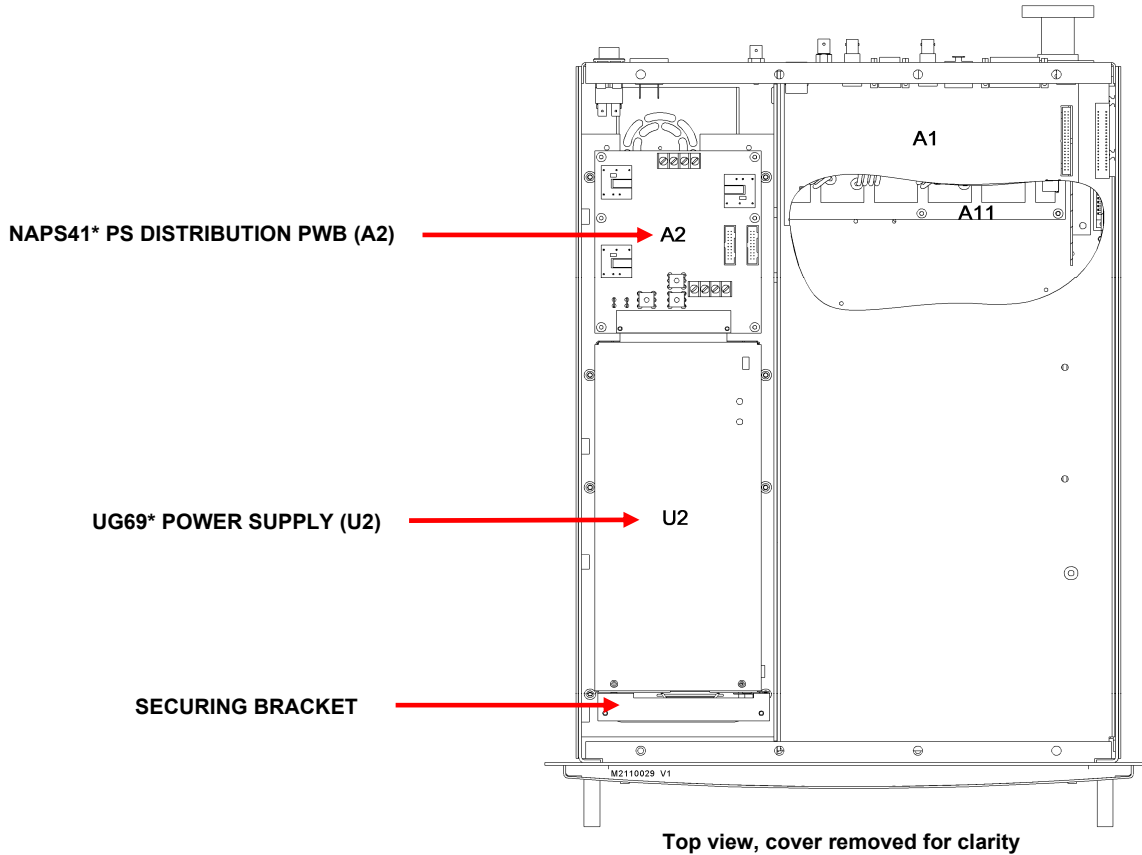


Figure 1: VS1 Top View with NAPS41* and UG69*

3 UG132 POWER SUPPLY/NAPS57A POWER SUPPLY DISTRIBUTION PWB INSTALLATION

Refer to Figure 2 and the attached Mechanical Drawing MD-4 for reference.

3A Power Supply Distribution PWB Installation

CAUTION!

The Power Supply Distribution PWB is static sensitive. Handle it in a static protected manner.

- (a) Clean surface where the Spacer Plate is to be installed with Isopropyl alcohol. See Figure 2.
- (b) Obtain the new Power Supply Distribution PWB (NAPS57A), Spacer Plate (Nautel part # 211-5313) and Alignment Jig (Nautel part # 211-9587) found in the Field Mod kit.
- (c) **Remove and discard** the pillars and star washers on the two mounting studs near the front of the transmitter (see Figure 2).
- (d) Temporarily install the Alignment Jig over the two mounting studs in step (c). Note orientation of jig (see Figure 2). Use the opening in the jig to align the Spacer Plate before securing to the PS Mounting Deck.
- (e) Secure the Spacer Plate to the PS Mounting Deck by removing the plastic coating from the double-sided tape on the Spacer Plate. Install using the Alignment Jig as shown in Figure 2, noting that plate orientation is not important for VS1 transmitters. Press firmly for 30 seconds until the Spacer Plate is secure.
- (f) Remove and discard the Alignment Jig.
- (g) Obtain two pillars (Nautel part # HMP61) from the Field Modification kit and install them – with two star washers (Nautel part # HMW10) from the Hardware Kit - on the mounting studs near the front of the transmitter (see Figure 2).
- (h) Obtain the new Power Supply Distribution PWB (NAPS57A), found in the Field Mod kit.
- (i) Using a 5.5 mm nutdriver, secure the Power Supply Distribution PWB with four of the six sets of M3 nuts, split and flat washers retained in Step 2B (d). Retain the other two sets for securing the Rear Support Bracket in Step 3B (d).

NOTE

Do not install the M3 nuts and washers on the two studs closest to the Power Supply at this time. The Rear Support Bracket secures the PWB to the chassis. See Figure 2.

- (j) Connect ribbon cable plugs W2P2 (to A2J2) and W4P2 (to A2J3) and quick-disconnects P7 (to E1) and P8 (to E2).

NOTE

Wire #11 is not used, tie back and secure with tyrap.

- (k) Connect wire #10 to terminal E3 using the M5 screw (Nautel part # HMSP19F, found in the Hardware kit) and wires #12, 13, 14, 16, 18, 20 and 22) to terminal blocks TB1 and TB2. Refer to the Wiring Lists section of the Troubleshooting manual for wiring and connector mating details. Torque connection on TB1 and TB2 to 6 inch-pounds (0.67 Newton-meters). Torque connection on E3 to 20 inch-pounds (2.24 Newton-meters).



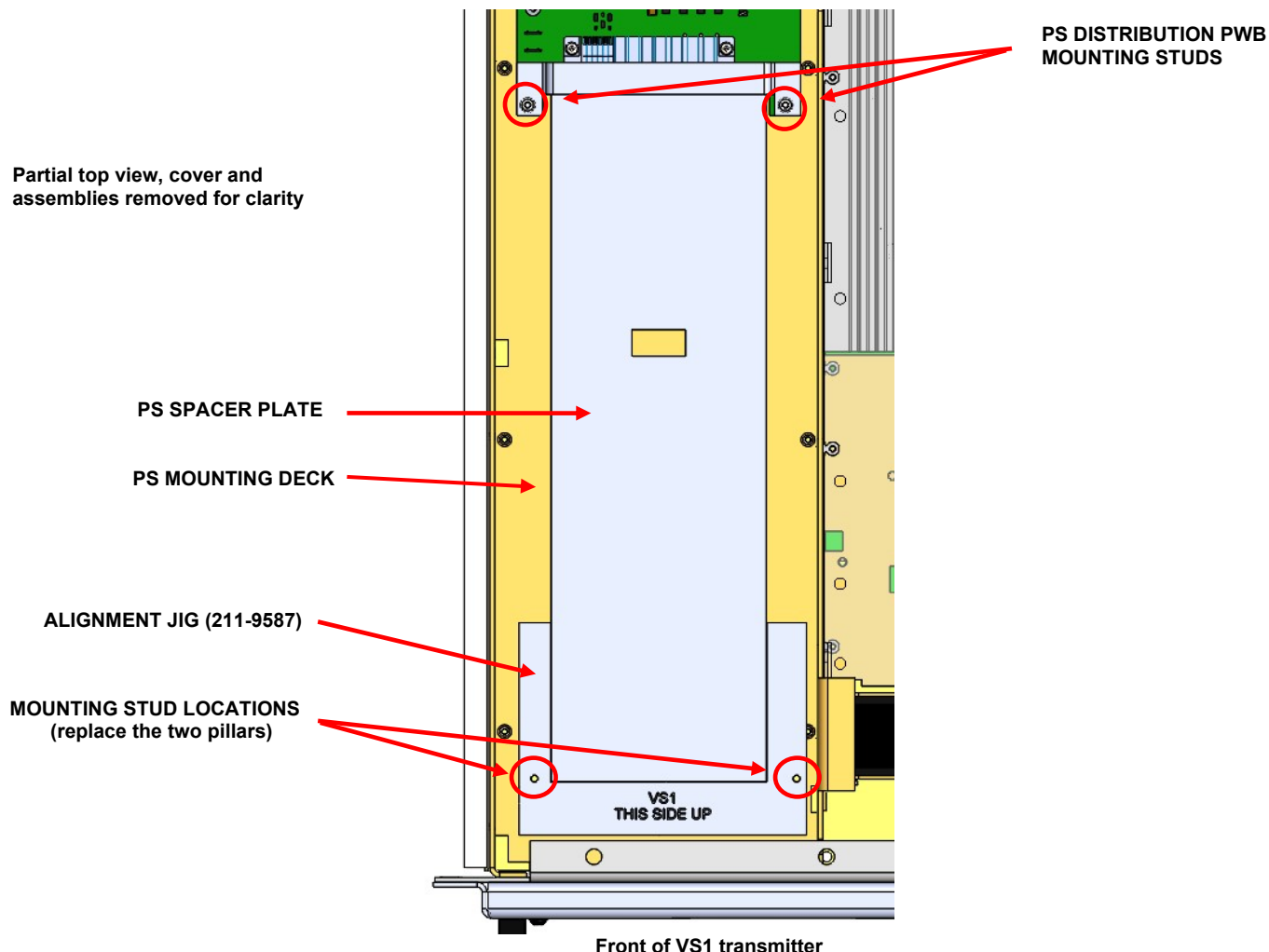


Figure 2: Spacer Plate and Alignment jig

3B Power Supply Installation

- Obtain the Power Supply (Nautel part # UG132), two Securing Brackets (Nautel Part #'s 211-5311 and 211-5312), two sets of M3 nuts, split and flat washers (Nautel part #'s HMN02, HMW32 and HMW02) and two M3 screws (Nautel part # HMSP10F), found in the Hardware Kit (Nautel part # 211-5316).

NOTE

When inserting or extracting the power supply, ensure the latch is in the closed/locked position.

- Install the new power supply module in the transmitter, slide it toward the rear of the transmitter to engage it with its mating connector. Note that the power supply module should be resting on its spacer plate when correctly positioned.
- Install the Front Support (Nautel part 211-5311) to the front of the UG132 Power Supply using the two M3 screws. See Figure 3.



- (d) Install the Rear Support Bracket (Nautel part 211-5312) to the rear of the UG132 Power Supply using the two sets of M3 nuts and washers retained in Step 3A (i). See Figure 3.
- (e) Install the VS1's top cover using the hardware retained in Step 2A (a).
- (f) Upgrade the software of the VS1 transmitter to VS SW 5.3.1 or later. Refer to the VS1 Operations and Maintenance manual for instructions.

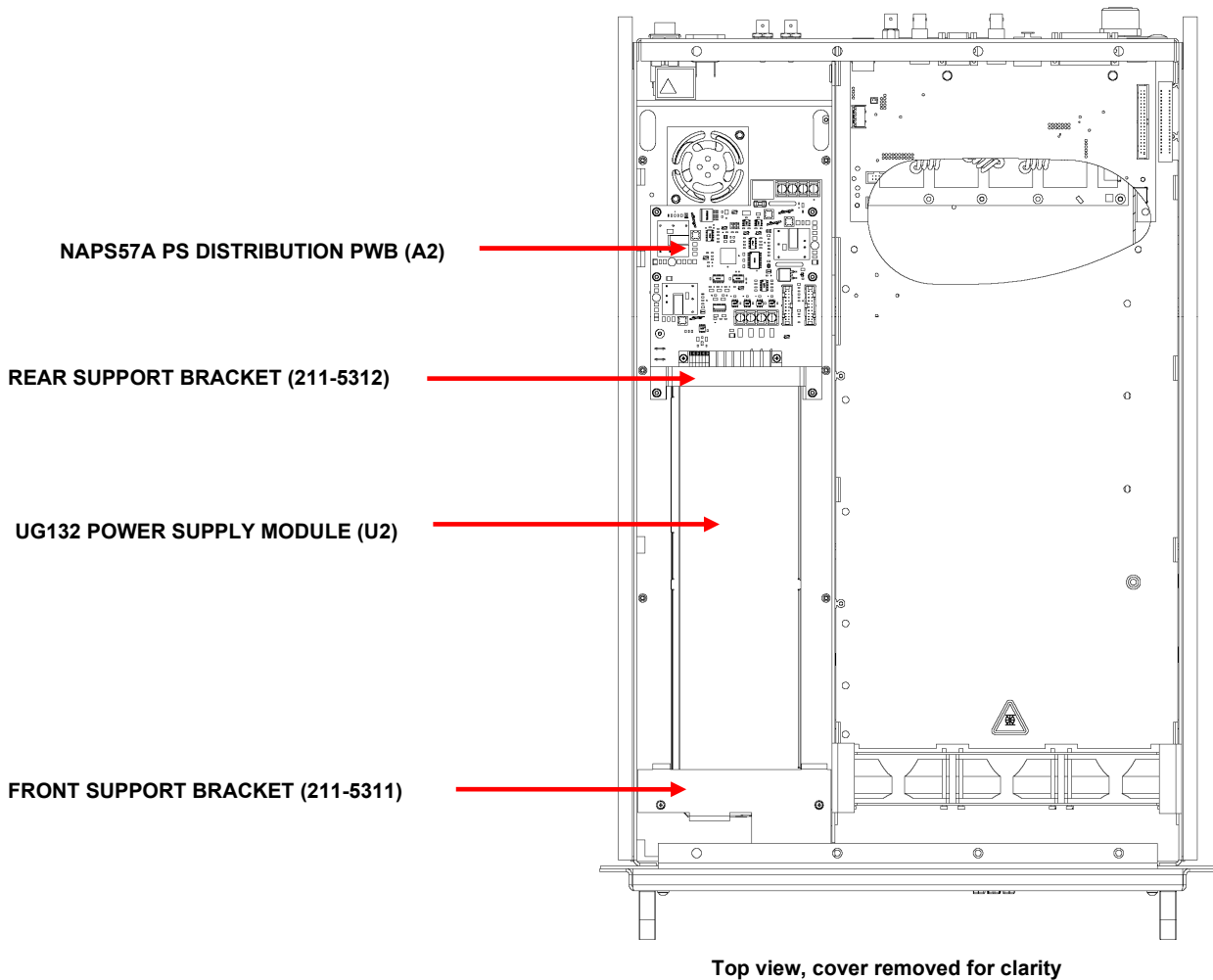


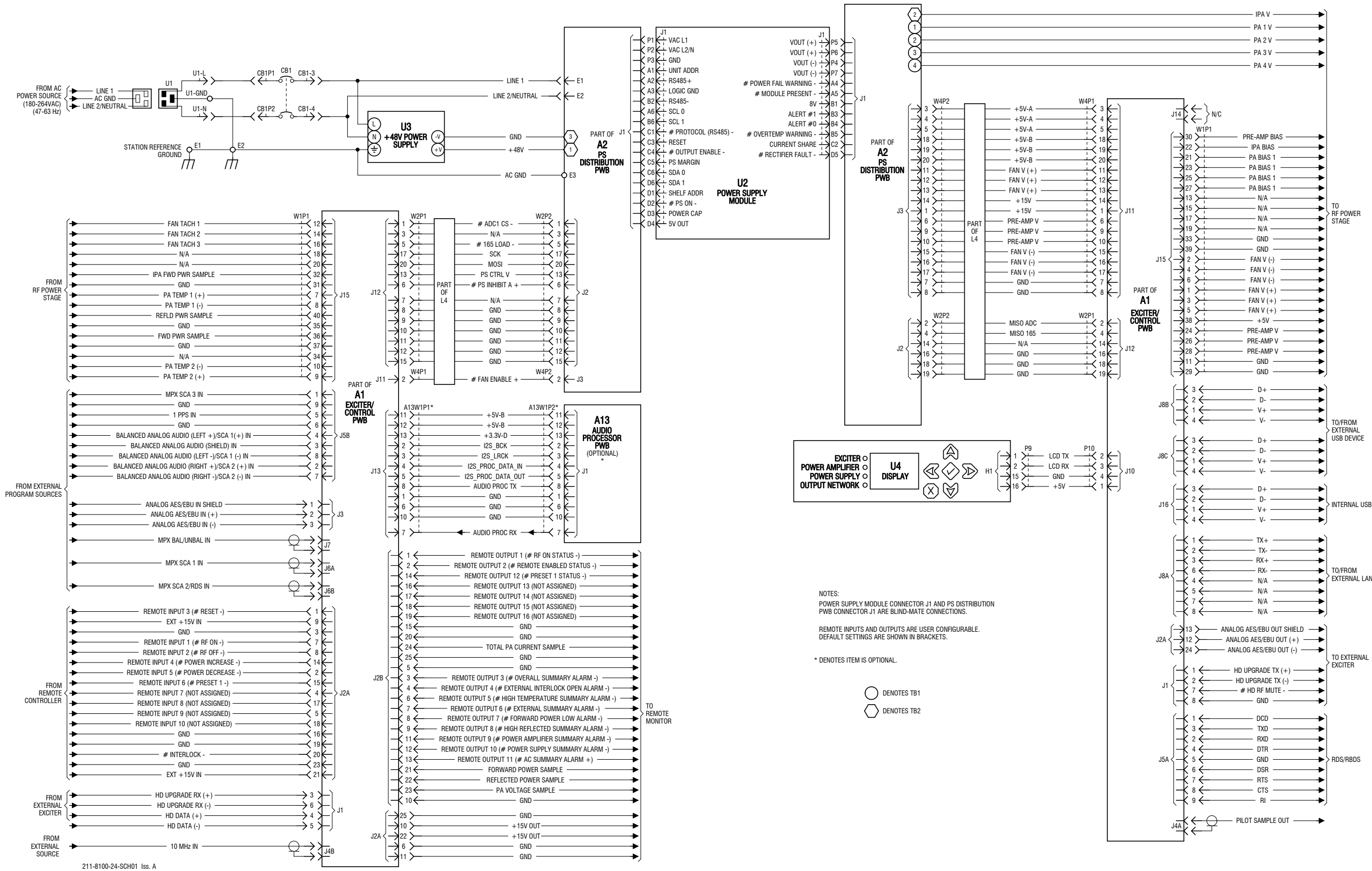
Figure 3: VS1 Top View with NAPS57A/UG132

The modification is complete. Return the transmitter to proper operation.

If you have any questions or require additional assistance, please contact Nautel's Customer Service Department at:

Telephone: 1-877-662-8835
Email: support@nautel.com





Electrical Schematic – VS1 Transmitter – Ac-Dc and Exciter/Control Stage

FM22005A – Manual Replacement Page

Not to Scale

Figure SD-1

Page 1 of 1

