



3: TROUBLESHOOTING MANUAL

VX150 to VX2 FM BROADCAST TRANSMITTER

Document ID:	NHB-VX150-VX2-TRB
Version:	2.0
Issue Date:	2023-04-20
Status:	Standard



Contact Information

Nautel Limited

10089 Peggy's Cove Road
Hackett's Cove, NS Canada B3Z 3J4

Toll Free: +1.877.6NAUTEL (662.8835)

(Canada & USA only) or

Phone: +1.902.823.3900 or

Fax: +1.902.823.3183

Nautel Inc.

201 Target Industrial Circle
Bangor, Maine USA 04401

Phone: +1.207.947.8200

Fax: +1.207.947.3693

Customer Service (24-hour support)

+1.877.628.8353 (Canada & USA only)

+1.902.823.5100 (International)

Email: support@nautel.com

Web: www.nautel.com

The comparisons and other information provided in this document have been prepared in good faith based on publicly available information. For verification of materials, the reader is encouraged to consult the respective manufacturer's most recent publication on the official website or through contact with Customer Service.

© Copyright 2022 NAUTEL. All rights reserved.

CONTENTS

Contact Information	3.iii
RELEASE CONTROL RECORD	3.vii
RESPONDING TO ALARMS	3.1.1
Corrective Maintenance	3.1.1
Electrostatic Protection	3.1.3
Identifying and Troubleshooting an Alarm	3.1.4
Replacement Procedures	3.1.36
Exciter PWB Replacement	3.1.37
Analog Audio PWB Replacement	3.1.40
PA Power Supply Replacement	3.1.43
Power Supply (+12 V) Replacement	3.1.45
Cooling Fan Replacement	3.1.48
Front Panel User Interface (FPUI) Display Replacement	3.1.54
Power Amplifier PWB Replacement	3.1.60
Pre-Amplifier/IPA PWB Replacement	3.1.65
	3.1.66
PARTS INFORMATION	3.2.1
Family Tree	3.2.1
How to Locate Information About a Specific Part	3.2.1
Column Content	3.2.2
WIRING INFORMATION	3.3.1
Wiring Lists Provided	3.3.1
Connector Mating Information	3.3.1
Wire Colours	3.3.1
Printed Wiring Board Patterns	3.3.1

ELECTRICAL SCHEMATICS	3.4.1
Component Values	3.4.1
Graphic and Logic Symbols	3.4.1
Reference Designations	3.4.1
Unique Symbols	3.4.2
Identifying Schematic Diagrams	3.4.2
Structure of Schematics	3.4.3
Locating Schematic Diagram(s) for a Functional Block	3.4.3
Locating a Part or Assembly on a Schematic	3.4.4

MECHANICAL DRAWINGS	3.5.1
Identifying Mechanical Drawings	3.5.1
Content of Mechanical Drawings	3.5.1
Locating a Part or Assembly on a Mechanical Drawing	3.5.1

LIST OF TERMS	3.6.1
---------------	-------

RELEASE CONTROL RECORD

ISSUE	DATE	REASON
2.0	2023-04-20	Release 2 for VX low power models. Supports hardware versions: VX150, VX300, VX600 (NARF81A) VX1 (NARF79A) VX1.5, VX2 (NARF80A) Supports software version VX SW 6.1.0 and later.

SECTION 3.1: RESPONDING TO ALARMS

This section provides instructions you need when performing troubleshooting on the VX150 to VX2 transmitter. This section includes the following topics:

- [Corrective Maintenance](#)
- [Electrostatic Protection - see page 3.1.3](#)
- [Identifying and Troubleshooting an Alarm - see page 3.1.4](#)
- [PA Resistance Checks - see page 3.1.35](#)
- [Replacement Procedures - see page 3.1.36](#)

If none of the procedures and alarms described in this section address your problem, contact Nautel for assistance. See “Technical Support” in the Installation Manual.

Corrective Maintenance

Corrective maintenance procedures consist of identifying and correcting defects or deficiencies that arise during transmitter operation. Local and/or remote alarm signals are generated when a malfunction occurs. If an alarm condition is caused by a malfunction in the RF power stage, the transmitter may maintain operation at a reduced RF output level. The nature of the fault – and station policy – will dictate whether an immediate maintenance response is necessary. Fault analysis and rectification may be conducted from three different levels, with a different technical competence level required for each: on-air troubleshooting, remote or local, and off-air troubleshooting.

CAUTION! The transmitter contains many solid state devices that may be damaged if subjected to excessive heat or high voltage transients. Take every effort to ensure that circuits are not overdriven or disconnected from their loads while turned on.

On-Air Troubleshooting

On-air troubleshooting can be performed from a remote location, or locally at the transmitter site.

Remote Troubleshooting

Remote on-air troubleshooting consists of monitoring the transmitter's radiated signal using an on-air monitor or via a LAN connection and observing the status of each remote fault alarm indicator. Information obtained from these sources should enable an operator to decide whether an alarm response may be deferred to a more convenient time, an immediate corrective action must be taken, or if a standby transmitter must be enabled (if one is available). It is recommended that the significance of remote indications, and the appropriate responses, be incorporated into a station's standard operating procedures. Refer to [Identifying and Troubleshooting an Alarm, on page 3.1.4](#) to determine the remedial action required for a given fault.

Local Troubleshooting

Local on-air troubleshooting consists of monitoring the transmitter's integral meters and fault alarm indicators. Analysis of this data will normally identify the type of fault, and in most cases will determine what corrective action must be taken. Refer to [Identifying and Troubleshooting an Alarm, on page 3.1.4](#) to determine the remedial action required for a given fault.

Off-Air Troubleshooting

Off-air troubleshooting must be performed when routine on-air adjustments will not restore operation.

It is recommended that the transmitter's output be connected to a precision 50 Ω resistive dummy load (rated for at least the maximum transmitter power rating) before starting off-air troubleshooting procedures. If an appropriate dummy load is not available, troubleshooting for a majority of faults can be performed with RF power turned off. The transmitter may remain connected to its antenna system for these procedures.

NOTE: *Reduce the RF output level to a minimal value when troubleshooting faults in the power amplifier stage while the transmitter's RF output is connected to the antenna system.*

Electrostatic Protection

The transmitter's assemblies contain semiconductor devices that are susceptible to damage from electrostatic discharge. The following precautions must be observed when handling an assembly which contains these devices.

CAUTION! Electrostatic energy is produced when two insulating materials are rubbed together. A person wearing rubber-soled shoes, walking across a nylon carpet or a waxed floor, can generate an extremely large electrostatic charge. This effect is magnified during periods of low humidity. Semiconductor devices such as integrated circuits, field-effect transistors, thyristors and Schottky diodes may be damaged by this high voltage unless adequate precautions are taken.

Electrical Discharging of Personnel

Personnel should be electrically discharged by a suitable grounding system (e.g., anti-static mats, grounding straps) when removing an assembly from the transmitter, and while handling the assembly for maintenance procedures.

Handling/Storage

An assembly should be placed in an anti-static bag when it is not installed in a host transmitter, or when it is not undergoing maintenance. Electronic components should be stored in anti-static materials.

Tools/Test Equipment

Testing and maintenance equipment – including soldering and unsoldering tools – should be suitable (i.e., grounded tip) for contact with static sensitive semiconductor devices.

Stress Current Protection

Every precaution should be taken to ensure the static sensitive semiconductor devices are protected from unnecessary stress current. This is achieved by ensuring that current is not flowing when an electrical connection is broken, and that voltages are not present on external control/monitoring circuits when they are connected.

Identifying and Troubleshooting an Alarm

You can identify an alarm locally by viewing the front panel user interface (UI) (see [Front Panel Alarm Checks](#)) or remotely by viewing the remote AUI's Alarms page (see [Remote AUI Alarms Page Checks](#), on page 3.1.6).

Front Panel Alarm Checks

There two ways to check for alarms on the front panel:

- [Fault LED](#)
- [Alarms Screen](#)

Fault LED

See [Figure 3.1.1](#). The FAULT LED on the right-hand side of the display indicates that a fault is present. The FAULT LED will be either off or red. When illuminated, the transmitter has encountered a summary fault. Use the remote AUI or local UI to view the status of the transmitter.

Figure 3.1.1: Transmitter Front Panel (VX1 shown for reference)



When a fault is present, the transmitter may still produce an RF output. In this case, or if the transmitter has shut down, you should schedule and commence more in-depth fault diagnosis. See [Alarms Screen](#), on page 3.1.5.

Alarms Screen

If an alarm exists and is currently being recognized by the transmitter system, it is displayed in the Alarms screen of the front panel display (see [Figure 3.1.2](#)).

Figure 3.1.2: Alarms Screen

P1		98.10 MHz - 0 W	14:20:16
◀ Active Alarms ▶			
Device	Alarm		
Exciter	Low AC Input		
Exciter	Host Not Booted		
Exciter	No Nameplate License		
Exciter	Invalid License(s)		
Exciter	Need to run auto-bias routine		
Exciter	External Interlock		

[Table 3.1.1 on page 3.1.7](#) contains a column for most alarms that can occur, sorted alpha-numerically. The Trigger, Clear and Troubleshooting columns provides a brief description of the alarm, troubleshooting tips and a cross-reference to more troubleshooting, if applicable.

1. Scroll through the Alarms screen to view the active faults.
2. Attempt to clear any latched alarms by selecting Alarms Reset from the Main Menu. If the alarm persists, it will not clear from the display.
3. Locate the alarm name in [Table 3.1.1 on page 3.1.7](#) to determine the cause of the alarm and perform any recommended procedures in the Description and Troubleshooting Action column. This may also lead to replacing a suspect PWB, power supply or fan, as detailed in [PA Resistance Checks, on page 3.1.35](#).

NOTE: Before undertaking any troubleshooting, record all meter readings and note if any other alarms are displayed on the Alarms screen. record all alarms.

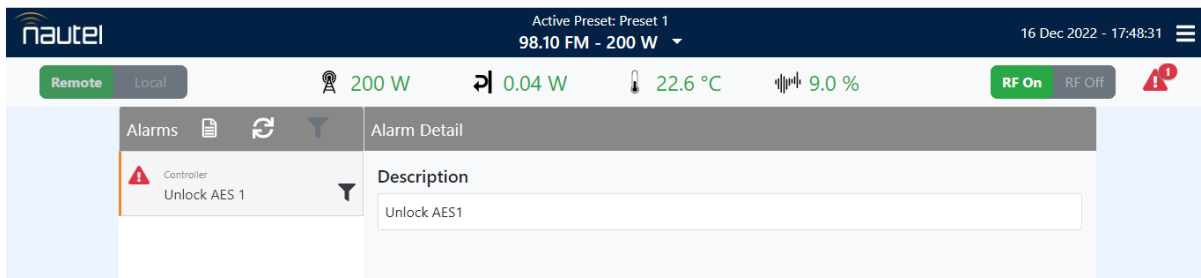
NOTE: [Table 3.1.1 on page 3.1.7](#) contains a column for most alarms that can occur, sorted alpha-numerically, including both the names displayed on the front panel and, if different, the remote AUI. The Trigger, Clear and Troubleshooting columns provides a description of the alarm, troubleshooting tips, and a link to detailed troubleshooting, as applicable.

4. If troubleshooting and subsequent replacement of a suspect PWB or module causes the alarm to disappear from the Alarms screen, the alarm has been successfully cleared. If the fault condition does not clear, contact Nautel.

Remote AUI Alarms Page Checks

If an alarm exists and is being recognized by the transmitter, it is displayed on the Alarms page (see [Figure 3.1.3](#)). The warning symbol in the upper, right section of the remote AUI dashboard (any page) will be amber or red when an alarm is present.

Figure 3.1.3: AUI Alarms Page



1. Click the warning symbol (or select Menu -> Alarms) to go to the Alarms page (see [Figure 3.1.3](#)). View the list of active faults. Alarms are listed by their name (Alarm Detail column).
2. Attempt to clear any latching alarms by pressing the Reset Latched Alarms icon at the top, left of the Alarms screen. If the alarm persists, it will not be cleared from the display.
3. Locate the alarm name in [Table 3.1.1 on page 3.1.7](#) to determine the cause of the alarm and perform any recommended procedures in the Troubleshooting column. This may also lead to replacing a suspect PWB, power supply or fan, as detailed in [PA Resistance Checks, on page 3.1.35](#).

NOTE: [Table 3.1.1 on page 3.1.7](#) contains a column for most alarms that can occur, sorted alphanumerically for each sub-system, including both the names displayed on the remote AUI and, if different, the front panel display. The **Troubleshooting** column provides a brief description of the alarm, troubleshooting tips and a cross-reference to more detailed troubleshooting, as applicable.

4. If troubleshooting and subsequent replacement of a suspect PWB or module causes the alarm to disappear from the Alarms page, the alarm has been successfully cleared. If the fault condition does not clear, contact Nautel.

NOTE: Before undertaking any troubleshooting, record all remote AUI meter readings and note if any other alarms are displayed on the Alarms page. Record all alarms. The most convenient way to do this is by using the remote AUI's Menu -> Reports page to download a report of the Alarm History (see "Alarm History" in the Operations & Maintenance Manual). Another method is to use a web browser over a LAN connection to save screen shots of critical status, meter and alarm pages. Go to the Dashboard -> Meters page to view (and save) detailed information (see "Viewing Meters" in the Operations & Maintenance Manual).

Table 3.1.1: Troubleshooting Alarms

Alarm Name	Trigger Conditions	Clear Conditions	Troubleshooting
AES1/2 Left Low Audio	The AES1/2 Left audio input level has fallen below the user configured low audio threshold for longer than the user configured timeout. The AES1/2 input must be configured as the main audio source in the active preset for this alarm to trigger. The Main Audio Low Audio Alarm must be enabled in the active preset for this alarm to occur. The presence of this alarm will cause a switch to the backup audio source if configured in the active preset.	This alarm will clear immediately when the AES1/2 Left audio input level has increased above the configured threshold. Performing an alarm reset will clear this alarm and reset the timeout. Clearing this alarm will cause a switch back to the main audio source if the transmitter was previously operating on the backup source.	Check the audio feed connected to the AES1/2 input. The most likely cause of this alarm is an interruption in audio distribution to the transmitter. Verify that the threshold level programmed in the active preset is below the normal audio input level by checking the AES1/2 Left meter. Verify that the configured timeout is long enough to cover any silence or dips in signal level.
AES1/2 Left Low Backup Audio	The AES1/2 Left audio input level has fallen below the user configured low audio threshold for longer than the user configured timeout. The AES1/2 input must be configured as the backup audio source in the active preset for this alarm to trigger. The Backup Low Audio Alarm must be enabled in the preset for this alarm to occur. The presence of this alarm will prevent a change to the backup audio source if configured in the active preset.	This alarm will clear immediately when the AES1/2 Left audio input level has increased above the configured threshold. Performing an alarm reset will clear this alarm and reset the timeout.	Check the audio feed connected to the AES1/2 input. The most likely cause of this alarm is an interruption in audio distribution to the transmitter. Verify that the threshold level programmed in the active preset is below the normal audio input level by checking the AES1/2 Left meter. Verify that the configured timeout is long enough to cover any silence or dips in signal level.

Alarm Name	Trigger Conditions	Clear Conditions	Troubleshooting
AES1/2 Right Low Audio	The AES1/2 Right audio input level has fallen below the user configured low audio threshold for longer than the user configured timeout. The AES1/2 input must be configured as the main audio source in the active preset for this alarm to trigger. The Main Audio Low Audio Alarm must be enabled in the active preset for this alarm to occur. The presence of this alarm will cause a switch to the backup audio source if configured in the active preset.	This alarm will clear immediately when the AES1/2 Right audio input level has increased above the configured threshold Performing an alarm reset will clear this alarm and reset the timeout. Clearing this alarm will cause switch back to the main audio source if the transmitter was previously operating on the backup source.	Check the audio feed connected to the AES1/2 input. The most likely cause of this alarm is an interruption in audio distribution to the transmitter. Verify that the threshold level programmed in the active preset is below the normal audio input level by checking the AES1/2 Right meter. Verify that the configured timeout is long enough to cover any silence or dips in signal level.
AES1/2 Right Low Backup Audio	The AES1/2 Right audio input level has fallen below the user configured low audio threshold for longer than the user configured timeout. The AES1/2 input must be configured as the backup audio source in the active preset for this alarm to trigger. The Backup Low Audio Alarm must be enabled in the preset for this alarm to occur. The presence of this alarm will prevent a change to the backup audio source if configured in the active preset.	This alarm will clear immediately when the AES1/2 Right audio input level has increased above the configured threshold. Performing an alarm reset will clear this alarm and reset the timeout.	Check the audio feed connected to the AES1/2 input. The most likely cause of this alarm is an interruption in audio distribution to the transmitter. Verify that the threshold level programmed in the active preset is below the normal audio input level by checking the AES1/2 Right meter. Verify that the configured timeout is long enough to cover any silence or dips in signal level.

Alarm Name	Trigger Conditions	Clear Conditions	Troubleshooting
AES1 Unlocked	The AES1 audio input is receiving invalid data or no data at all. The AES1 input must be configured as the main audio source in the active preset for this alarm to trigger.	This alarm will clear after the AES1 input receives at least 8 consecutive valid samples.	Check the audio feed connected to the AES1 input. The most likely cause of this alarm is a complete interruption in the AES audio connection to the transmitter. Check for disconnected cables, or a failure in upstream equipment. Swap the input to AES2 and verify the reception of audio on that port through the AES2 Left and Right Meters. The meters will show a N/A value if the source is unlocked.
AES2 Unlocked	The AES2 audio input is receiving invalid data or no data at all. The AES2 input must be configured as the main audio source in the active preset for this alarm to trigger.	This alarm will clear after the AES2 input receives at least 8 consecutive valid samples.	Check the audio feed connected to the AES2 input. The most likely cause of this alarm is a complete interruption in the AES audio connection to the transmitter. Check for disconnected cables, or a failure in upstream equipment. Swap the input to AES2 and verify the reception of audio on that port through the AES2 Left and Right Meters. The meters will show a N/A value if the source is unlocked.

Alarm Name	Trigger Conditions	Clear Conditions	Troubleshooting
Analog Audio PWB +12V Failure	The Analog Audio PWB +12V Meter measures less than 6V for a period of at least 5 seconds.	The Analog Audio PWB +12V Meter measures greater than 6V for at least 5 seconds.	The most likely failure is the connection between the Exciter and Analog Audio PWB or a component failure on the Analog Audio PWB. Check the connection between the Exciter and Analog Audio PWB and measure the voltage at TP2 on the Analog Audio PWB. Consider replacement of the Analog Audio PWB. See Analog Audio PWB Replacement on page 3.1.40 .
Analog Audio PWB Audio Failure	The Exciter has failed to detect a valid Analog Audio data stream and/or a valid MPX data stream from the Analog Audio PWB.	The Exciter has detected valid Analog Audio and MPX data streams from the Analog Audio PWB.	The most likely failure is the connection between the Exciter and Analog Audio PWB or a component failure on the Analog Audio PWB. Check the connection between the Exciter and Analog Audio PWB. Consider replacement of the Analog Audio PWB. See Analog Audio PWB Replacement on page 3.1.40 .
Analog Audio PWB DC Voltage Failure	Any of the following Analog Audio PWB voltage meters meet the stated criteria for a period of at least 5 seconds: ■ Analog Audio PWB +8V Meter measures less than +4 V or greater than +12 V ■ Analog Audio PWB -8V Meter measures greater than -4 V or less than -12 V ■ Analog Audio PWB +5V Meter measures less than +2.5 V or greater than +7.5 V	All of the following Analog Audio PWB voltage meters meet the stated criteria for a period of at least 5 seconds: ■ Analog Audio PWB +8V Meter measures between +4 V and +12 V ■ Analog Audio PWB -8V Meter measures between -4 V and -12 V ■ Analog Audio PWB +5V Meter measures between +2.5 V and +7.5 V	If the Analog Audio PWB +12V Failure alarm is present, this is the most likely cause, so refer to the troubleshooting for that alarm. The next most likely cause is a component failure on the Analog Audio PWB. Consider replacement of the Analog Audio PWB. See Analog Audio PWB Replacement on page 3.1.40 .

Alarm Name	Trigger Conditions	Clear Conditions	Troubleshooting
Analog Left Low Audio	The Analog Left audio input level has fallen below the user configured low audio threshold for longer than the user configured timeout. The Analog L/R input must be configured as the main audio source in the active preset for this alarm to trigger. The Main Audio Low Audio Alarm must be enabled in the active preset for this alarm to occur. The presence of this alarm will cause a switch to the backup audio source if configured in the active preset.	This alarm will clear immediately when the Analog Left audio input level has increased above the configured threshold. Performing an alarm reset will clear this alarm and reset the timeout. Clearing this alarm will cause a switch back to the main audio source if the transmitter was previously operating on the backup source.	Check the audio feed connected to the Analog Left input. The most likely cause of this alarm is an interruption in audio distribution to the transmitter. Verify that the threshold level programmed in the active preset is below the normal audio input level by checking the Analog Left meter. Verify that the configured timeout is long enough to cover any silence or dips in signal level. Swap the Analog Left and Right Inputs to verify whether the issue follows the source or the input.
Analog Left Low Backup Audio	The Analog Left audio input level has fallen below the user configured low audio threshold for longer than the user configured timeout. The Analog input must be configured as the backup audio source in the active preset for this alarm to trigger. The Backup Low Audio Alarm must be enabled in the preset for this alarm to occur. The presence of this alarm will prevent a change to the backup audio source if configured in the active preset.	This alarm will clear immediately when the Analog Left audio input level has increased above the configured threshold. Performing an alarm reset will clear this alarm and reset the timeout.	Check the audio feed connected to the Analog Left input. The most likely cause of this alarm is an interruption in audio distribution to the transmitter. Verify that the threshold level programmed in the active preset is below the normal audio input level by checking the Analog Left meter. Verify that the configured timeout is long enough to cover any silence or dips in signal level. Swap the Analog Left and Right Inputs to verify whether the issue follows the source or the input.

Alarm Name	Trigger Conditions	Clear Conditions	Troubleshooting
Analog Right Audio Low	The Analog Right audio input level has fallen below the user configured low audio threshold for longer than the user configured timeout. The Analog L/R input must be configured as the main audio source in the active preset for this alarm to trigger. The Main Audio Low Audio Alarm must be enabled in the active preset for this alarm to occur. The presence of this alarm will cause a switch to the backup audio source if configured in the active preset.	This alarm will clear immediately when the Analog Right audio input level has increased above the configured threshold. Performing an alarm reset will clear this alarm and reset the timeout. Clearing this alarm will cause a switch back to the main audio source if the transmitter was previously operating on the backup source.	Check the audio feed connected to the Analog Right input. The most likely cause of this alarm is an interruption in audio distribution to the transmitter. Verify that the threshold level programmed in the active preset is below the normal audio input level by checking the Analog Right meter. Verify that the configured timeout is long enough to cover any silence or dips in signal level. Swap the Analog Left and Right Inputs to verify whether the issue follows the source or the input.
Analog Right Low Backup Audio	The Analog Right audio input level has fallen below the user configured low audio threshold for longer than the user configured timeout. The Analog input must be configured as the backup audio source in the active preset for this alarm to trigger. The Backup Low Audio Alarm must be enabled in the preset for this alarm to occur. The presence of this alarm will prevent a change to the backup audio source if configured in the active preset.	This alarm will clear immediately when the Analog Right audio input level has increased above the configured threshold. Performing an alarm reset will clear this alarm and reset the timeout.	Check the audio feed connected to the Analog Right input. The most likely cause of this alarm is an interruption in audio distribution to the transmitter. Verify that the threshold level programmed in the active preset is below the normal audio input level by checking the Analog Right meter. Verify that the configured timeout is long enough to cover any silence or dips in signal level. Swap the Analog Left and Right Inputs to verify whether the issue follows the source or the input.

Alarm Name	Trigger Conditions	Clear Conditions	Troubleshooting
Audio Processor Offline	The Orban Inside Present switch is enabled in the Front Panel UI Settings -> System menu but the Exciter is not detecting the physical connection to the Orban Inside.	The Orban Inside Present switch is disabled in the Front Panel UI Settings -> System menu or, if it is enabled, the Exciter has detected that the Orban Inside is physically connected.	If no Orban Inside is installed, disable the Orban Inside Present switch in the Front Panel UI Settings -> System menu. Check that the cable between the Exciter and Orban Inside is seated correctly. Consider replacement of the Orban Inside PWB.
Audio Processor Output Failure	The trigger conditions for this alarm match whatever the user has set for the Low Audio or Low Backup Audio alarm for the audio Source currently feeding the Audio Processor but are applied to the audio being received from the output of the Audio Processor.	This alarm will clear immediately when the Audio Processor output level has increased above the configured threshold. Performing an alarm reset will clear this alarm and reset the timeout. This alarm will be suppressed if the Low Audio or Low Backup Audio alarm for the source feeding the Audio Processor is active.	Check that the cable between the Exciter and Orban Inside is seated correctly. Consider replacement of the Orban Inside PWB.
Autobias Fail	The Autobias routine was unable to achieve the desired bias current for 1 or more IPA/PA when last run or failed to run due to a missing pre-condition.	The Autobias routine completed successfully. Performing an alarm reset will clear this alarm.	The most likely cause of this alarm is a PA or IPA failure. Check PA and IPA FETs and fuses. Ensure interlock is closed and RF is off when starting the Autobias Routine. If this alarm is present with no corresponding IPA or PA bias failure alarm, then a pre-condition of the routine has not been met. This could be caused by a faulty PA power supply, missing connection, or other defect.
Autobias Running	This alarm is triggered immediately on running the Autobias routine and will remain active while the routine is running.	Clears once the Autobias routine has completed.	The Autobias routine will timeout after 3 minutes. If this alarm is active for longer than 3 minutes cycle AC and attempt the Autobias routine again.

Alarm Name	Trigger Conditions	Clear Conditions	Troubleshooting
Boot Configuration Failed	A serious fault has occurred during one of the stages of the initial configuration of the Exciter PWB that takes place after AC power has been applied/restored or after a software upgrade.	The initial configuration of the Exciter PWB that takes place after AC power has been applied/restored or after a software upgrade has completed successfully.	The likely cause is damage to configuration files or firmware stored on the SD Card. Replace the SD Card or run a Software Update. Component failure on the Exciter PWB. Consider replacement of the Exciter PWB. See Exciter PWB Replacement on page 3.1.37 .
Clock PLL Unlocked	The PLL in the RF clock generator has not locked or become unlocked from its programmed frequency.	The PLL in the RF clock generator is locked to its programmed frequency.	The likely causes of this alarm are: Error in configuring the clock generator caused by damaged configuration files. Replace the SD Card or run a Software Update. Out of range external 10 MHz input when using external 10 MHz to calibrate the VCXO. Check the external 10 MHz signal. Component failure on the Exciter PWB. Consider replacement of the Exciter PWB. See Exciter PWB Replacement on page 3.1.37 .
DMPX 1/2 Low Audio	The DMPX1/2 input level has fallen below the user configured low audio threshold for longer than the user configured timeout. The DMPX1/2 input must be configured as the main audio source in the active preset for this alarm to trigger. The Main Audio Low Audio Alarm must be enabled in the active preset for this alarm to occur. The presence of this alarm will cause a switch to the backup audio source if configured in the active preset.	This alarm will clear immediately when the DMPX1/2 input level has increased above the configured threshold Performing an alarm reset will clear this alarm and reset the timeout. Clearing this alarm will cause switch back to the main audio source if the transmitter was previously operating on the backup source.	Check the audio feed connected to the DMPX1 (AES1)/DMPX2 (AES2) input. The most likely cause of this alarm is an interruption in audio distribution to the transmitter. Verify that the threshold level programmed in the active preset is below the normal audio input level by checking the DMPX1/2 meter. Verify that the configured timeout is long enough to cover any silence or dips in signal level.

Alarm Name	Trigger Conditions	Clear Conditions	Troubleshooting
DMPX 1 Low Backup Audio	The DMPX1 input level has fallen below the user configured low audio threshold for longer than the user configured timeout. The DMPX1 input must be configured as the backup audio source in the active preset for this alarm to trigger. The Backup Low Audio Alarm must be enabled in the preset for this alarm to occur. The presence of this alarm will prevent a change to the backup audio source if configured in the active preset.	This alarm will clear immediately when the DMPX1 input level has increased above the configured threshold. Performing an alarm reset will clear this alarm and reset the timeout.	Check the audio feed connected to the DMPX1 (AES1) input. The most likely cause of this alarm is an interruption in audio distribution to the transmitter. Verify that the threshold level programmed in the active preset is below the normal audio input level by checking the DMPX1 meter. Verify that the configured timeout is long enough to cover any silence or dips in signal level.
DMPX 2 Low Backup Audio	The DMPX2 input level has fallen below the user configured low audio threshold for longer than the user configured timeout. The DMPX2 input must be configured as the backup audio source in the active preset for this alarm to trigger. The Backup Low Audio Alarm must be enabled in the preset for this alarm to occur. The presence of this alarm will prevent a change to the backup audio source if configured in the active preset.	This alarm will clear immediately when the DMPX2 input level has increased above the configured threshold. Performing an alarm reset will clear this alarm and reset the timeout.	Check the audio feed connected to the DMPX2 (AES2) input. The most likely cause of this alarm is an interruption in audio distribution to the transmitter. Verify that the threshold level programmed in the active preset is below the normal audio input level by checking the DMPX2 meter. Verify that the configured timeout is long enough to cover any silence or dips in signal level.
Entered Firmware Update	The Exciter PWB has detected that the firmware on the System Interface PWB needs to be updated and has started the update process.	The Exciter PWB has completed updating the firmware on the System Interface PWB. If it was unsuccessful, then a Firmware Update Failure will be active	This alarm may occur after completing a software update and cycling AC. This is part of the normal Software Upgrade process.

Alarm Name	Trigger Conditions	Clear Conditions	Troubleshooting
Exciter +12V Failure	The Exciter PWB +12V Meter measures less than 6 V for a period of at least 5 seconds.	The Exciter PWB +12V Meter measures greater than 6 V for at least 5 seconds.	The most likely failure is the connection between the Exciter PWB and System Interface PWB or a component failure on the Exciter PWB or the System Interface PWB. Check the connection between the Exciter PWB and System Interface PWB. Measure the voltage at TP8 on the Exciter PWB and TP12 on the System Interface PWB. Consider replacement of the Exciter PWB, System Interface PWB, or the 12V Power Supply. See Exciter PWB Replacement on page 3.1.37 or Power Supply (+12 V) Replacement on page 3.1.45.
Exciter Booted	The Exciter firmware has loaded successfully and started running. This alarm is logged but not displayed as an active alarm. Should appear in the logs every time the AC power has been applied/restored or after a software upgrade.	Cleared on a power cycle or a reboot/software update.	This alarm should appear in the logs every time the AC power has been applied/restored or after a software upgrade to indicate the Exciter firmware has loaded successfully and started running.

Alarm Name	Trigger Conditions	Clear Conditions	Troubleshooting
Exciter DC Voltage Failure	Any of the following Exciter PWB voltage meters meet the stated criteria for a period of at least 5 seconds: ■ Exciter PWB +5V Meter measures less than +2.5 V or greater than +7.5 V ■ Exciter PWB +3.3V Meter measures less than +1.65 V or greater than +4.95 V ■ Exciter PWB +2.5V Meter measures less than +1.25 V or greater than +3.75 V ■ Exciter PWB +1.5V Meter measures less than +0.75 V or greater than +2.25 V ■ Exciter PWB +1.1V Meter measures less than +0.55 V or greater than +1.65 V	All of the following Analog Audio PWB voltage meters meet the stated criteria for a period of at least 5 seconds: ■ Exciter PWB +5V Meter measures between +2.5 V and +7.5 V ■ Exciter PWB +3.3V Meter measures between +1.65 V and +4.95 V ■ Exciter PWB +2.5V Meter measures between +1.25 V and +3.75 V ■ Exciter PWB +1.5V Meter measures between +0.75 V and +2.25 V ■ Exciter PWB +1.1V Meter measures between +0.55 V and +1.65 V	If the Exciter PWB +12V Failure alarm is present, this is the most likely cause, so refer to the troubleshooting for that alarm. Check the corresponding voltage test points on the Exciter PWB using a digital multimeter. The next most likely cause is a component failure on the Exciter PWB. Consider replacement of the Exciter PWB. See Exciter PWB Replacement on page 3.1.37.
Exciter Fault	Summary alarm that is triggered if any of the following alarms are triggered: ■ Exciter +12V Failure ■ Exciter DC Voltage Failure ■ PGA Failure ■ Invalid FPGA Image Signature	Cleared if all of the following alarms are cleared: ■ Exciter +12V Failure ■ Exciter DC Voltage Failure ■ FPGA Failure ■ Invalid FPGA Image Signature	Summary alarm to indicate a possible serious fault with the Exciter PWB. See the troubleshooting for the associated alarms in order to clear this alarm.
External Interlock	Open connection between pins 1 and 2 on the transmitter's Interlock connector (Exciter J7).	Closed connection between pins 1 and 2 on the Transmitter's Interlock connector.	If integrated in a site interlock system, then verify the status of that interlock connection. If using a jumper, verify the presence of a jumper by examining transmitter rear panel Interlock connector. A mating connector and jumper are installed in the Transmitter Interlock connector before shipping.

Alarm Name	Trigger Conditions	Clear Conditions	Troubleshooting
Fan1/2 Failure	The Fan 1/2 Speed meter is below 1500 RPM for at least 30 seconds. Fan 1/2 must be active (target speed greater than 0) for this alarm to trigger.	This alarm will clear immediately if the Fan 1/2 Speed meter is above 1500 RPM.	Check Fan 1/2 for obstruction or damage. Check Fan 1/2 connection to the System Interface PWB Replace Fan 1/2 as needed. See Cooling Fan Replacement on page 3.1.48 . Note that Fan 1/2 is inactive when RF is OFF, therefore this alarm will clear if RF is turned OFF.
Fan1/2 Low Speed	The Fan 1/2 Speed meter is less than 50% of the target speed for at least 30 seconds. Fan 1/2 must be active (target speed greater than 0) for this alarm to trigger	This alarm will clear immediately if the Fan 1/2 Speed meter is above 1500 RPM.	Check Fan 1/2 for obstruction or damage. Check Fan 1/2 connection to the System Interface PWB Replace Fan 1/2 as needed. Note that Fan 1/2 is inactive when RF is OFF, therefore this alarm will clear if RF is turned OFF. See Cooling Fan Replacement on page 3.1.48 .
Fan Fail Shutback	At least 1 Fan Failure alarm is active. This will cause the transmitter to inhibit RF to prevent damage or degradation. RF must be ON to trigger this alarm	This alarm will clear immediately if all Fan Failure alarms are cleared.	Check Fans for obstruction or damage. Check fan connections to the System Interface Board Replace Fan(s) as needed. See Cooling Fan Replacement on page 3.1.48 .
Firmware Update Failure	The Exciter PWB detected a failure while trying to update the firmware on the System Interface PWB.	The Exciter PWB successfully updated the firmware on the System Interface PWB.	Check the connection between the Exciter PWB and the System Interface PWB. Cycle the AC power to the transmitter to trigger another attempt to update the firmware on the System Interface PWB. Perform a Software Update again to replace any damaged firmware files.

Alarm Name	Trigger Conditions	Clear Conditions	Troubleshooting
FPGA Failure	The FPGA was either not programmed or failed to respond after being programmed as part of the configuration process that occurs when the Exciter starts up.	The FPGA responded after being programmed as part of the configuration process that occurs when the Exciter starts up.	The likely causes are a missing or corrupt FPGA image file as a result of a damaged SD Card. Either replace the SD Card or perform a Software Update to install a new FPGA image. The next most likely cause is a damaged FPGA. Consider replacement of the Exciter PWB. See Exciter PWB Replacement on page 3.1.37 .
Display Failure	The front panel display module has not completed a successful update in at least 150us.	This alarm will clear immediately on a successful update of the display.	Check display connections and verify display operation locally. Consider replacing the display if unresponsive. See Front Panel User Interface (FPU) Display Replacement on page 3.1.54 .
High Ambient Temperature Shutback	The Ambient Temperature meter has exceeded 55°C for at least 1 minute. This alarm will temporarily inhibit RF until cleared to protect the transmitter from overheating.	This alarm will clear automatically if the Ambient Temperature meter falls below 50°C, restoring RF operation	Check site cooling. Ensure the Transmitter's air intake is unobstructed.
High Ambient Temperature Warning	The Ambient Temperature meter has exceeded 50°C for at least 30 seconds.	This alarm will clear immediately if the Ambient Temperature meter falls below 45°C. This alarm will be suppressed if the High Ambient Temperature Shutback Alarm is active.	Check site cooling. Ensure the transmitter's air intake is unobstructed.
High Forward Power	The Forward Power meter exceeds 110% of the Output Power setpoint for at least 1 second.	The Forward Power meter is less than 110% of the Output Power Setpoint for at least 1 second.	This alarm may trigger when substantially reducing the transmitter's setpoint. If the alarm is persistent or reoccurring, AC cycle transmitter. If the behavior persists contact Nautel.

Alarm Name	Trigger Conditions	Clear Conditions	Troubleshooting
High Heatsink Temperature Shutdown	The Heatsink Temperature meter has exceeded 80°C in VX150 to VX1 models, or 110°C in VX1.5 to VX2 models for at least 1 minute. This alarm will inhibit the RF output when triggered to prevent component damage.	This alarm must be cleared by performing an alarm reset in the Front Panel UI, AUI, or via the transmitters discrete remote I/O.	Check site cooling. Ensure the transmitter's air intake is unobstructed.
High Heatsink Temperature Warning	The Heatsink Temperature meter has exceeded 70°C in VX150 to VX1 models, or 100°C in VX1.5 to VX2 models for at least 30 seconds.	This alarm will clear automatically if the Heatsink Temperature Meter falls below 65°C in VX150 to VX1 models, or 95°C in VX1.5 to VX2 models for at least 30 seconds. This alarm is suppressed if the High Heatsink Temperature Shutdown alarm is active.	Check site cooling. Ensure the transmitter's air intake is unobstructed.
High RF Drive	The RF drive power meter measuring power out of the IPA is greater than the model specific maximum drive limit.	The RF drive power meter measuring power out of the IPA is less than the model specific maximum drive limit.	Check IPA/PA connections to the System Interface PWB and in VX1.5 and VX2 the RF Drive Splitter PWB. Power Cycle to transmitter to reset the drive power control system.
High SWR	The Transmitter's SWR meter is greater than 1.4:1.	The Transmitter's SWR meter reports less than 1.38:1.	This alarm is most likely caused by an issue in the output transmission line or antenna system. Check for faults in transmission line or the antenna system, measure load SWR at the transmitter output.
High SWR Shutdown	The Transmitter's SWR meter is greater than 3.0:1. The presence of this alarm will inhibit RF operation.	This alarm must be cleared by performing an alarm reset in the Front Panel UI, AUI, or via the transmitters discrete remote I/O.	This alarm is most likely caused by an issue in the output transmission line or antenna system. Check for faults in transmission line or the antenna system, measure load SWR at the transmitter output.

Alarm Name	Trigger Conditions	Clear Conditions	Troubleshooting
Host Network Down	The Host is not detecting the presence of valid Ethernet connection to the transmitter.	The Host has detected the presence of valid Ethernet connection to the transmitter.	The most likely cause of this alarm is a disconnected or damaged Ethernet cable. Check that the Ethernet cable is securely connected to the transmitter.
Host Not Booted	The DSP has yet to receive any communication from the Host. This alarm is normal for approximately one to five minutes while the host is booting, immediately after AC power has been applied/restored or after a software upgrade. The remote AUI will not yet be available while this alarm is present.	This alarm clears immediately once the DSP has received at least one successful communication packet from the Host.	If this alarm continues to occur for more than 30 minutes after AC power has been applied to the transmitter, cycle (turn off, then on) the AC power. If the alarm continues to persist after an additional 30 minutes, it is likely the SD card is corrupted. Replace the SD card with a backup SD card or perform a software update to restore the SD card to a functional state.
Host Not Responding	The DSP has not had any communication from the Host for greater than 60 seconds. The remote AUI may not be available while this alarm is present.	This alarm clears immediately once the DSP has received a successful communication packet from the Host.	This alarm is most likely caused by an issue with the Host either becoming excessively busy or crashing. Reboot the transmitter or cycle the AC power to force the Host to reboot
Invalid Date & Time	After AC power has been applied/restored or after a software upgrade, the Real-Time Clock reported that an invalid date and time was retrieved and the system has not had valid date and time set.	A valid date and/or time has set via any of the following methods: ■ Set in the FPUI ■ Set in the AUI ■ Via NTP when it is enabled ■ Received over RDS when enabled	The most likely cause is that the transmitter has been left unpowered for an extended period of time and the Real-Time Clock lost power. Set the time and/or date via one of the methods listed. If this does not resolve the alarm, it could be caused by a component failure on the Exciter PWB. Consider replacement of the Exciter PWB. See Exciter PWB Replacement on page 3.1.37 .
Invalid FPGA Image Signature	not available at time of release		

Alarm Name	Trigger Conditions	Clear Conditions	Troubleshooting
Invalid License(s)	At least one invalid or corrupt license has been detected during the configuration of the Exciter PWB.	No invalid or corrupt licenses have been detected during the configuration of the Exciter PWB.	Damaged or corrupt license file. Contact Nautel about restoring the license file. Replacing the System Interface PWB will invalidate the current license file. Contact Nautel to obtain a new license file.
IPA Bias Fail	During the Autobias routine the IPA bias current target was not achieved within the required time or DC bias voltage range.	This alarm is cleared by starting the Autobias routine. Performing an alarm reset will clear this alarm.	Check the IPA connections, fuse, and FET. Attempt to operate the transmitter at minimum power. If the Low Forward Power or Low RF Drive alarms are triggered, then consider replacing the IPA. See Pre-Amplifier/IPA PWB Replacement on page 3.1.65 .
IPA Fail	The IPA current is less than 200mA when RF is ON, or the IPA voltage sample is less than 9.6 volts.	This alarm must be cleared by performing an alarm reset in the Front Panel UI, AUI, or via the transmitters discrete remote I/O.	Check the IPA connections, fuse, and FET. Attempt to operate the transmitter at minimum power. If the Low Forward Power or Low RF Drive alarms are triggered, then consider replacing the IPA. See Pre-Amplifier/IPA PWB Replacement on page 3.1.65 .
Low Ac Input	The Ac Voltage meter is less than 185 Vac in a VX1.5 or VX2 model.	The Ac Voltage meter is greater than 185 Vac in a VX1.5 or VX2 model. The AC Voltage meter is greater than 90 Vac in a VX150 to VX1 model.	The most likely cause for this alarm is a phase failure or brownout on the Ac supply to the transmitter. Check the Ac supply voltage at the transmitter connection. Connect the transmitter to a suitable supply greater than 185 Vac.

Alarm Name	Trigger Conditions	Clear Conditions	Troubleshooting
Low Ac Foldback	The AC Voltage meter is less than 185 VAC and the output power setpoint in the active preset is greater than 750W. The presence of this alarm will cause a reduction in output power to 750W. This alarm is only present in VX1.5 and VX2 models.	The AC voltage meter is greater than 185 VAC. This alarm will also clear if RF is OFF or if the output power setpoint in the active preset is reduced to below 750W.	The most likely cause for this alarm is a phase failure or brownout on the AC supply to the transmitter. Check the AC supply voltage at the transmitter connection. If the Transmitter has been intentionally connected to a 120 VAC supply, then reduce the setpoint below 750W.
Low Ac Shutback	The AC Voltage meter is less than 90 VAC. The presence of this alarm will temporarily inhibit RF operation until cleared.	This alarm will automatically clear when the AC Voltage meter is greater than 90 VAC.	The most likely cause for this alarm is a brownout or other failure on the AC supply to the transmitter. Check the AC supply voltage at the transmitter connection.
Low Ambient Temperature Warning	The Ambient Temperature meter is less than 0°C. No action is taken on this alarm.	This alarm will automatically clear when the Ambient Temperature meter is greater than 5°C.	Check site heating or ventilation system. Allow transmitter to warm above 0°C before operating.
Low Forward Power	The Forward Power meter measures a value less than the Low Forward Power Threshold (User-Adjustable, default: 50% of the active preset output power setpoint) for at least 1 second. No action is taken on this alarm.	This alarm will automatically clear when the Forward Power meter value is greater than the Low Forward Power Threshold for at least 1 second.	Check for other transmitter alarms, this alarm serves as a general indicator resulting from any substantial reduction of Transmitter Forward Power.
Low RF Drive	The RF Drive meter measures a value less than the minimum expected drive level for the given transmitter model when RF is ON and uninhibited.	The RF Drive meter measures a value greater than the minimum expected drive level for the given transmitter model. This alarm will automatically clear if RF is turned OFF or RF is otherwise inhibited.	The most likely cause of this alarm is either an IPA failure, an Exciter failure, or a disconnection in-between. Check the IPA connections, fuse, and FET. Check the signal level out of the Exciter J10 using a spectrum analyzer or other RF measurement device.

Alarm Name	Trigger Conditions	Clear Conditions	Troubleshooting
Missing External 10 MHz	The external 10 MHz has been enabled in the Transmitter Settings page of the FPUI and a 10 MHz signal has not been detected on the input for at least 1 second.	The external 10 MHz has been disabled in the Transmitter Settings page of the FPUI or a 10 MHz signal has been detected on the input for at least 1 second.	Check the connection to the external 10 MHz source. Disable the external 10 MHz source in the Transmitter Settings page of the FPUI if not in use.
Missing External 1PPS	The external 1PPS has been enabled by virtue of enabling Pilot Synchronization in the current preset and a 1PPS signal has not been detected on the input for at least 1 second.	The external 1PPS has been disabled by virtue of disabling Pilot Synchronization in the current preset or a 1PPS signal has been detected on the input for at least 1 second.	Check the connection to the external 1PPS source. Disable the external 1PPS source by turning off Pilot Synchronization in the current preset if not in use.
Modulation Loss	The modulation meter is less than the user configured threshold in the active preset for a duration exceeding the configured timeout. The presence of this alarm can inhibit RF (see Modulation Loss Shutback) or change presets, if configured to do so in the active preset.	This alarm will clear immediately once the modulation meter is greater than the user configured threshold in the active preset. Performing an alarm reset will clear this alarm. The modulation loss alarm has been disabled in the active preset.	The most likely cause of this meter is loss of audio or composite signal into the transmitter. Check the program input signal level and, if configured, for the presence of any low audio alarms. Confirm that the audio settings in the active preset are configured correctly. If levels and audio are as expected, adjust the threshold or timeout for the alarm to avoid false alarms.
Modulation Loss Shutback	The modulation meter is less than the user configured threshold in the active preset for a duration exceeding the configured timeout. The modulation loss alarm must be enabled and configured to RF inhibit for this alarm to trigger. This alarm will inhibit the RF output until cleared.	This alarm will clear immediately once the modulation meter is greater than the user configured threshold in the active preset. Performing an alarm reset will clear this alarm.	The most likely cause of this meter is loss of audio or composite signal into the transmitter. Check the program input signal level and, if configured, for the presence of any low audio alarms.

Alarm Name	Trigger Conditions	Clear Conditions	Troubleshooting
MPX 1/2 Low Audio	The MPX1/2 input level has fallen below the user configured low audio threshold for longer than the user configured timeout. The MPX1/2 input must be configured as the main audio source in the active preset for this alarm to trigger. The Main Audio Low Audio Alarm must be enabled in the active preset for this alarm to occur. The presence of this alarm will cause a switch to the backup audio source if configured in the active preset.	This alarm will clear immediately when the MPX1/2 input level has increased above the configured threshold. Performing an alarm reset will clear this alarm and reset the timeout. Clearing this alarm will cause a switch back to the main audio source if the transmitter was previously operating on the backup source.	Check the composite feed connected to the MPX1/2 input. The most likely cause of this alarm is an interruption in composite distribution to the transmitter. Verify that the threshold level programmed in the active preset is below the normal input level by checking the MPX1/2 meter. Verify that the configured timeout is long enough to cover any silence or dips in signal level.
MPX 1/2 Low Backup Audio	Check the composite feed connected to the MPX1/2 input. The most likely cause of this alarm is an interruption in composite distribution to the transmitter. Verify that the threshold level programmed in the active preset is below the normal input level by checking the MPX1/2 meter. Verify that the configured timeout is long enough to cover any silence or dips in signal level.	This alarm will clear immediately when the MPX1/2 audio input level has increased above the configured threshold. Performing an alarm reset will clear this alarm and reset the timeout.	Check the audio feed connected to the MPX1/2 input. The most likely cause of this alarm is an interruption in composite distribution to the transmitter. Verify that the threshold level programmed in the active preset is below the normal audio input level by checking the MPX1/2 meter. Verify that the configured timeout is long enough to cover any silence or dips in signal level.
Need to run Autobias Routine	No saved PA or IPA bias voltages loaded when the transmitter booted, the Autobias routine should be run. When triggered, the system will fall back to default bias voltages.	This alarm will clear when the Autobias routine is run.	If this alarm is present, it's most likely that a configuration file contained on the transmitter SD card has been corrupted or is missing. Run the Autobias routine in Settings->Transmitter Settings->Run Autobias Routine.

Alarm Name	Trigger Conditions	Clear Conditions	Troubleshooting
No Exciter Comms	The System Interface PWB is not receiving valid communication packets from the Exciter.	The System Interface PWB receives a valid communication packet from the Exciter.	This alarm is most likely caused by temporary comms interruptions during software upgrades or Exciter reboots. If the alarm is occurring outside of those cases check the connection between the Exciter and System Interface Board.
No Nameplate License	The License.json file loaded from the SD card at boot is corrupted or missing. When present, this alarm may limit the output power of the transmitter. If the Transmitter model is a VX1 it's likely you will observe PA2 failures.	This alarm requires an AC cycle or Exciter reboot to clear. To remain cleared, the system must boot with a valid license file.	The most likely cause of this alarm is installation of a new generic SD card after replacement. By default, the SD does not contain any license file as this file is unique to each transmitter. It is also possible that the license file has become unreadable due to corruption. Contact Nautel customer support for your transmitter's license key and instructions on how to re-load the key.
On Audio Backup	This alarm will trigger when the Transmitter switches to operating on a backup audio source as configured in the active preset.	This alarm will clear immediately when the main audio source returns. Performing an alarm reset will clear this alarm.	This alarm should always be present with a low audio alarm. It serves as an additional indicator that a switch to the backup audio source has occurred.
PA 1 Bias Fail	The Autobias routine was unable to reach the 150mA target bias current for PA 1 within the timeout of 3 minutes or within the allowable minimum and maximum bias voltages.	This alarm is cleared by starting the Autobias routine. Performing an alarm reset will clear this alarm.	Check PA 1 connections, fuse, and FET. The most likely cause of this alarm is a bad connection or failed PA. Attempt to re-run the Autobias routine. Check the System Interface Board (See SD-9) TP5 & TP6 voltage matches the PA (1) Bias meter when RF is ON and operating. Consider replacing PA 1. See Power Amplifier PWB Replacement on page 3.1.60 .

Alarm Name	Trigger Conditions	Clear Conditions	Troubleshooting
PA Fail/PA1 Fail	In all models this alarm will trigger if the PA current is less than 50mA while the system is RF ON and operating. In VX1.5 and VX2 this alarm will also trigger if the PA current is less than 50% of the average of the two PA current meters.	This alarm must be cleared by performing an alarm reset in the Front Panel UI, AUI, or via the transmitters discrete remote I/O.	Check PA 1 connections, fuse, and FET. The most likely cause of this alarm is a bad connection or failed PA. Consider replacing PA 1. See Power Amplifier PWB Replacement on page 3.1.60 .
PA 2 Bias Fail	The Autobias routine was unable to reach the 150mA target bias current for PA 2 within the timeout of 3 minutes or within the allowable minimum and maximum bias voltages.	This alarm is cleared by starting the Autobias routine. Performing an alarm reset will clear this alarm.	Check PA 2 connections, fuse, and FET. The most likely cause of this alarm is a bad connection or failed PA. Attempt to re-run the Autobias routine. Check the System Interface Board (See SD-9) TP7 voltage matches the PA 2 Bias meter when RF is ON and operating. Consider replacing PA 2. See Power Amplifier PWB Replacement on page 3.1.60 .
PA2 Fail	This alarm will trigger if the PA current is less than 50mA while the system is RF ON and operating. It will also trigger if the PA current is less than 50% of the average of the two PA current meters. This alarm is only present in VX1.5 & VX2 models.	This alarm must be cleared by performing an alarm reset in the Front Panel UI, AUI, or via the transmitters discrete remote I/O.	Check PA 2 connections, fuse, and FET. The most likely cause of this alarm is a bad connection or failed PA. Consider replacing PA 2. See Power Amplifier PWB Replacement on page 3.1.60 .

Alarm Name	Trigger Conditions	Clear Conditions	Troubleshooting
PA High Power Dissipation	At least one PA Power Dissipation meter has measured higher than 350W for at least 30 seconds. This alarm will cause a foldback in transmitter output power to limit PA power dissipation to 350W.	All transmitter PA Power Dissipation meters measure less than 350W and the transmitter has returned to the preset output power setpoint. Performing an alarm reset will clear this alarm.	This alarm is most likely caused by changes in load SWR. Check for the Reflected Power and SWR meters to observe any load changes that can effect PA efficiency. Check the transmitter cooling system as PA efficiency decreases with temperature.
Preset Error(s)	A preset is loaded, either on startup or when switching between presets, that contains at least one element that is invalid.	When a preset is loaded that has valid values for all its components. Performing an alarm reset will clear this alarm.	The likely cause is corruption of a stored preset. Edit the preset to verify that all the settings are correct. A preset that was valid for a different model transmitter has been loaded. Edit the preset to adjust any invalid settings.
PS Fail	The PA power supply has reported an internal failure based on its own diagnostic criteria for failure.	This alarm is only cleared when the power supply reports no failure.	Check power supply LED's, a red fault or orange maintenance LED indicate a need for replacement. A blinking green DC LED may suggest a short circuit on the output of the power supply, check PA(s) for short circuit failure. Remove, wait 30 seconds, and re-install power supply.
PS Not Compatible	The PA power supply has reported a comcode (model) that is not compatible with this system.	The PA power supply reports a correct comcode.	The power supply installed does not match the correct model for use in this transmitter. The most likely cause is that an off the shelf part was used as a replacement. Contact Nautel customer service for a compatible replacement power supply.

Alarm Name	Trigger Conditions	Clear Conditions	Troubleshooting
PS Not Installed	The PA power supply has been removed as indicated by the absence of a grounded pin connection on the power supply connector.	The PA Power Supply is installed, and the present pin has been grounded by the power supply.	Install Power supply. Verify there is no obstruction in the power supply connector. The PS Present pin is measured using an ADC on the Power Supply Interface PWB. If problems persist check connections to this board.
SCA MPX 1/2 Low Composite	The MPX1/2 input level has fallen below the user configured low audio threshold for longer than the user configured timeout. The MPX1/2 input must be configured as a composite SCA source in the active preset for this alarm to trigger. The SCA MPX 1/2 Low Alarm must be enabled in the active preset for this alarm to occur.	This alarm will clear immediately when the MPX1/2 input level has increased above the configured threshold. Performing an alarm reset will clear this alarm and reset the timeout.	Check the composite feed connected to the MPX1/2 input. The most likely cause of this alarm is an interruption in composite distribution to the transmitter. Verify that the threshold level programmed in the active preset is below the normal input level by checking the MPX1/2 meter. Verify that the configured timeout is long enough to cover any silence or dips in signal level.
SCA1 AES1 Left Low Audio	The AES1 Left audio input level has fallen below the user configured low audio threshold for longer than the user configured timeout. The AES1 input must be configured as a SCA source in the active preset for this alarm to trigger. The SCA 1 Low Alarm must be enabled in the active preset for this alarm to occur.	This alarm will clear immediately when the AES1 left input level has increased above the configured threshold. Performing an alarm reset will clear this alarm and reset the timeout.	Check the audio feed connected to the AES1 input. The most likely cause of this alarm is an interruption in audio distribution to the transmitter. Verify that the threshold level programmed in the active preset is below the normal input level by checking the AES1 Left meter. Verify that the configured timeout is long enough to cover any silence or dips in signal level.

Alarm Name	Trigger Conditions	Clear Conditions	Troubleshooting
SCA1 Analog Left Low Audio	The Analog Left audio input level has fallen below the user configured low audio threshold for longer than the user configured timeout. The Analog Left audio input must be configured as a SCA source in the active preset for this alarm to trigger. The SCA 1 Low Alarm must be enabled in the active preset for this alarm to occur.	This alarm will clear immediately when the Analog Left input level has increased above the configured threshold. Performing an alarm reset will clear this alarm and reset the timeout.	Check the audio feed connected to the Analog Left input. The most likely cause of this alarm is an interruption in audio distribution to the transmitter. Verify that the threshold level programmed in the active preset is below the normal input level by checking the Analog Left meter. Verify that the configured timeout is long enough to cover any silence or dips in signal level.
SCA2 AES2 Left Low Audio	The AES2 Left audio input level has fallen below the user configured low audio threshold for longer than the user configured timeout. The AES2 input must be configured as a SCA source in the active preset for this alarm to trigger. The SCA 2 Low Alarm must be enabled in the active preset for this alarm to occur.	This alarm will clear immediately when the AES2 left input level has increased above the configured threshold. Performing an alarm reset will clear this alarm and reset the timeout.	Check the audio feed connected to the AES2 input. The most likely cause of this alarm is an interruption in audio distribution to the transmitter. Verify that the threshold level programmed in the active preset is below the normal input level by checking the AES2 Left meter. Verify that the configured timeout is long enough to cover any silence or dips in signal level.
SCA2 Analog Right Low Audio	The Analog Right audio input level has fallen below the user configured low audio threshold for longer than the user configured timeout. The Analog Right audio input must be configured as a SCA source in the active preset for this alarm to trigger. The SCA 2 Low Alarm must be enabled in the active preset for this alarm to occur.	This alarm will clear immediately when the Analog Right input level has increased above the configured threshold. Performing an alarm reset will clear this alarm and reset the timeout.	Check the audio feed connected to the Analog Right input. The most likely cause of this alarm is an interruption in audio distribution to the transmitter. Verify that the threshold level programmed in the active preset is below the normal input level by checking the Analog Right meter. Verify that the configured timeout is long enough to cover any silence or dips in signal level.

Alarm Name	Trigger Conditions	Clear Conditions	Troubleshooting
SIB Communication Failure	The System Interface PWB microcontroller has failed to respond to at least 2 or more consecutive attempts to poll parameter values. When this alarm has been triggered the transmitter will automatically enable remote control via the AUI as communication with the front panel buttons will not be operational.	This alarm will clear when the System Interface PWB microcontroller provides a response to all of its polled parameters in a single attempt.	This alarm is most likely caused by an issue in the connection between the Exciter and System Interface PWB. Check this connection. Verify the Green CPU OK LED is blinking on the System Interface PWB. Consider replacement of the System Interface Board, contact Nautel Customer Support.
Summary Fault	The Summary Fault will trigger when any system alarm is active.	The Summary Fault will clear when there are no active alarms.	The Summary Fault is not an alarm, but instead provides a summary indication that the system has active alarms. This serves as a method of indication when monitoring the transmitter via SNMP or the Remote IO Interface. Check the transmitters alarms via the Front Panel UI or remote AUI.
SWR Cutback	At least 5 SWR Shutbacks have occurred within a 20 second period. This alarm has 3 levels, representing power reductions to 75%, 50%, and 25% of the preset output power setpoint. Every series of 5 Shutbacks will lead to a transition to the next lower power reduction level. If Shutbacks continue at 25% of the setpoint this will trigger an SWR Shutdown.	This alarm will attempt to automatically clear between 30 seconds and 6.5 minutes after triggering depending on the level of cutback reached. Level 1 (75%) takes 30 seconds to clear Level 2 (50%) takes 2 minutes to clear Level 3 (25%) takes 4 minutes to clear Timeouts are cumulative, meaning that each level must be successfully cleared before proceeding to the next.	This alarm is most likely caused by an issue in the output transmission line or antenna system. Check for faults in transmission line or the antenna system, measure load SWR at the transmitter output.

Alarm Name	Trigger Conditions	Clear Conditions	Troubleshooting
SWR Foldback	The Reflected Power meter measured value is greater than the foldback threshold. By default, the models have the following thresholds: VX150=6W, VX300=12W, VX600=24W, VX1=40W, VX1.5=60W, VX2=80W. The default thresholds are based on the absolute reflected power equivalent to a 1.5:1 SWR at nameplate power. This threshold can be adjusted between 1.1 and 1.5:1 SWR in the transmitter settings page of the Front Panel User Interface. This alarm will cause a Foldback to occur, reducing the amount of forward power out to maintain reflected power at the foldback threshold.	The reflected power meter measured value is less than the foldback threshold, and the transmitter is no longer limiting forward power.	This alarm is most likely caused by an issue in the output transmission line or antenna system. Antenna icing particularly can often cause foldback to occur as SWR slowly rises due to ice building on the antenna. Check for faults in transmission line or the antenna system, measure load SWR at the transmitter output. Be cautious when adjusting the SWR foldback threshold, as directivity error is pronounced when measuring reflected power at low SWR and may cause premature foldback.
SWR Shutback	The instantaneous reflected power has quickly exceeded the shutback threshold. This will cause an immediate inhibit of the RF output to protect the RF PA(s). The Shutback threshold is based on the reflected power equivalent to a 2:1 SWR at the transmitter models nameplate power. (Ex. VX2=222W).	This alarm will automatically clear immediately after the transmitter is inhibited. After clearing, the transmitter will attempt to resume operation at the active preset output power. Subsequent Shutbacks may trigger cutback.	This alarm is most likely caused by an issue in the output transmission line or antenna system. Shutback specifically responds to fast increases in reflected power caused by open/short circuits, lightning strikes, or arcs. Check for faults in transmission line or the antenna system, looking out particularly for any evidence of arcing.

Alarm Name	Trigger Conditions	Clear Conditions	Troubleshooting
SWR Shutdown	The VSWR meter value is greater than 3.0:1. This will immediately trigger a shutdown and inhibit the transmitters RF output. This threshold can be adjusted between 1.1 and 1.5:1 SWR in the transmitter settings page of the Front Panel User Interface.	This alarm must be cleared by performing an alarm reset in the Front Panel UI, AUI, or via the transmitters discrete remote I/O.	This alarm is most likely caused by an issue in the output transmission line or antenna system. Check for faults in transmission line or the antenna system, measure load SWR at the transmitter output. SWR Shutdown will often follow SWR foldback as SWR increases past the shutdown threshold. Be cautious when adjusting the SWR shutdown threshold, as directivity error is pronounced when measuring low SWR and may cause premature shutdown.
System Controller Interlock	The interlock connection on the System Controller Interface has been opened. This alarm presents identical behavior to the "External Interlock" Alarm. When enabled the System Controller Interlock acts in series with the External Interlock. The Transmitter must be set up as an N+1 system using a Nautel System Controller for this alarm to appear.	The Interlock connection on the System Controller Interface is closed.	This alarm is only applicable to N+1 systems using a Nautel System Controller. If this alarm is present, it's most likely the System Controller is inhibiting the transmitter. Check the System Controller status and alarms.
Very Low Forward Power	The Forward Power meter value is below the Very Low Forward Power Threshold for at least 1 second. The default value for this alarm to trigger is 12.5% of the Output Power Setpoint in the active preset. The threshold can be adjusted by the user in the AUI or Front Panel User Interface. No action is taken on this alarm. This alarm will suppress the Low Forward Power alarm when triggered.	The Forward Power meter value is above the Very Low Forward Power Threshold for at least 1 second.	Check for other transmitter alarms, this alarm serves as a general indicator resulting from any severe reduction of Transmitter Forward Power.

PA Resistance Checks

CAUTION! Perform the following checks with the Ac power disconnected from the transmitter. FETs are static sensitive and must be handled in a static protected manner.

Repeat for PA2 (for VX1.5/VX2 only, if applicable).

1. Using a digital multimeter, check the continuity across fuse F1 on the suspect PA PWB.
 - ❖ If the measurement is an open circuit, replace the PA PWB (see [Power Amplifier PWB Replacement, on page 3.1.60](#)).
 - ❖ If the measurement is short circuit (near 0 Ω), proceed to [Step 2](#).
2. Using a digital multimeter, measure the resistance between each gate lead of the FET and the metal flange of the FET. Note: gate leads are located on the same side of the FET as the input RF connector.
 - ❖ If the measurement is less than 8 k Ω , replace the PA PWB (see [Power Amplifier PWB Replacement, on page 3.1.60](#)).
 - ❖ If the measurement is between 8 k Ω and 17.5 k Ω , check the other PA PWBs for a failure. If none of the other PA PWBs have failed, replace the original suspect PA PWB.
 - ❖ If the measurement is greater than 17.5 k Ω , proceed to [Step 3](#).
3. Disconnect the PA Volts cable from E1 and using a digital multimeter, check the continuity between each drain lead of the FET (positive meter probe) and the metal flange of the FET (negative meter probe).
 - ❖ If the measurement is open circuit, the PA PWB is OK and does not require replacement. Continue troubleshooting and suspect a problem with an associated PWB.
 - ❖ If the measurement is not open circuit, replace the PA PWB (see [Power Amplifier PWB Replacement, on page 3.1.60](#)).

Replacement Procedures

Table 3.1.2 lists the procedures available in this manual for replacing PWBs and modules that have been designated as lowest replaceable units (LRUs).

Table 3.1.2: Replacement Procedures

Module	Replacement Procedure
Exciter PWB	See page 3.1.37
Analog Audio PWB	See page 3.1.40
PA Power Supply	See page 3.1.43
Power Supply (Internal)	See page 3.1.45
Cooling Fans	See page 3.1.48
Front Panel UI (FPUI)	See page 3.1.54
Power Amplifier PWB	See page 3.1.60
Pre-Amplifier/IPA PWB	See page 3.1.65

NOTE: *The USB provided with the transmitter contains videos (mp4 format) that support the replacement procedures in this section. Go to the USB's HOME screen and click VIDEOS. Videos for replacing LRUs are listed in the Maintenance section.*

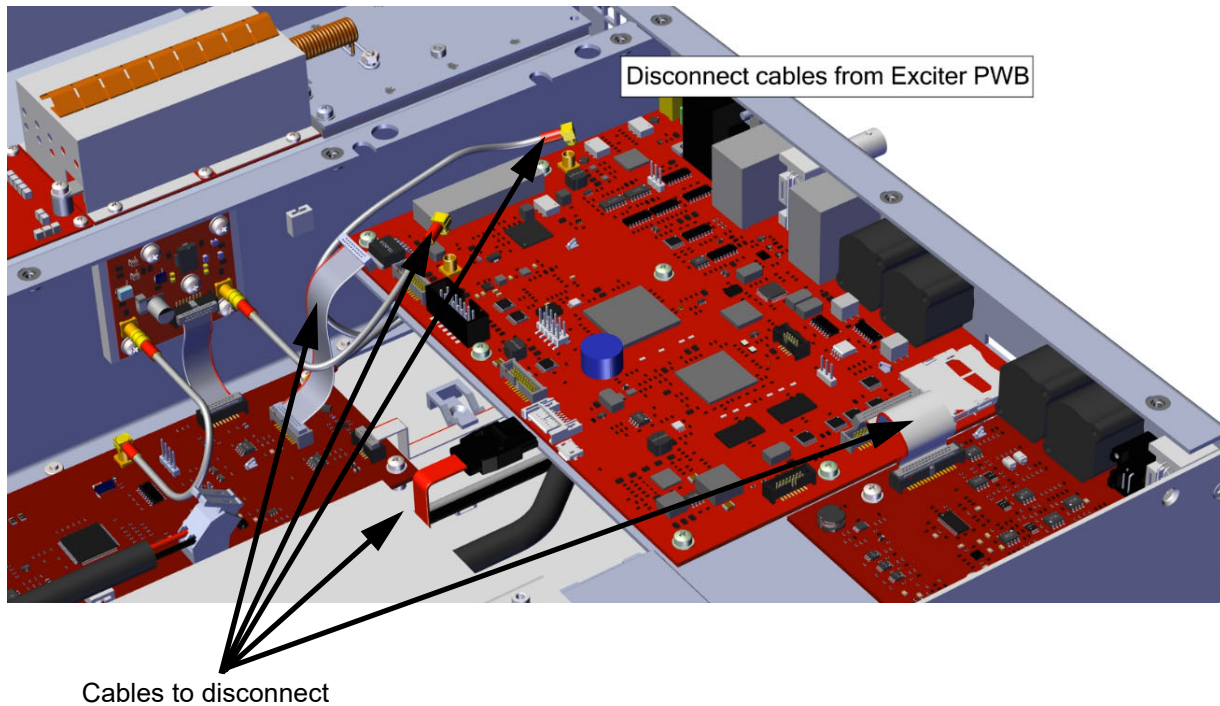
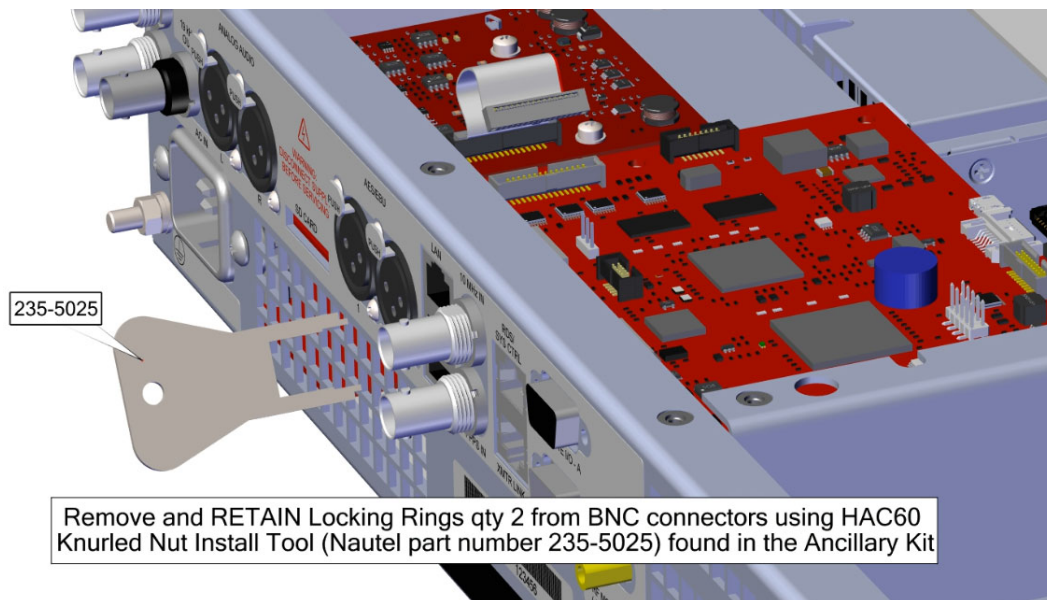
Exciter PWB Replacement

CAUTION! The Exciter PWB is static sensitive and must be handled in a static protected manner.

NOTE: *The USB provided with the transmitter contains videos (mp4 format) that support the replacement procedures in this section. Go to the USB's HOME screen and click VIDEOS. Videos for replacing LRUs are listed in the Maintenance section.*

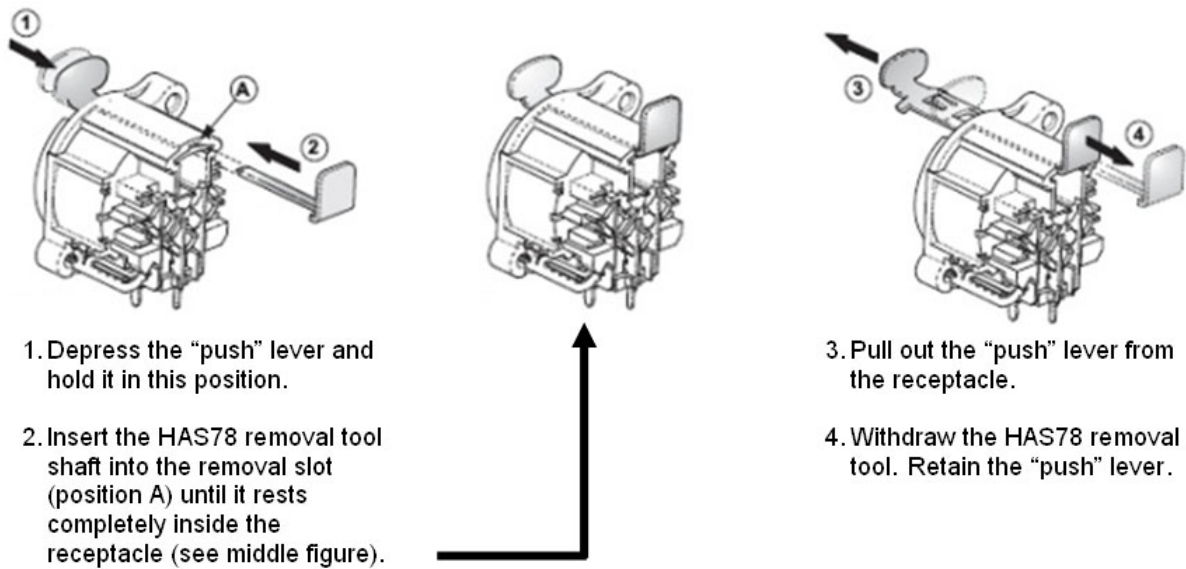
See MD-1 or MD-2 in the Mechanical Drawings section of this manual for the location of the Exciter PWB.

1. Turn RF off and disconnect ac power from the transmitter.
2. Disconnect all cables from the rear of the transmitter (noting connections).
3. If applicable, remove and retain the four screws securing the transmitter in the rack.
4. Place the transmitter on a suitable workbench.
5. Remove and retain the SD card from the rear of the transmitter.
6. Remove and retain the 21 M3 screws securing the top cover. Remove cover.
7. Disconnect the five cables from Exciter PWB (six cables if the Orban Audio Processor is installed), noting connections. See [Figure 3.1.4 on page 3.1.38](#).
8. From the rear of the transmitter, remove and retain the nut and washer from the RF Sample connector using an 8 mm nut driver.
9. Remove and retain the External Interlock terminal block.
10. Remove and retain the four Jack screws from the two Remote I/O D-sub connectors using a 3/16" socket or nut driver.
11. Obtain the Knurled Nut Install Tool (Nautel Part # 235-5025), found in the ancillary kit.
12. Remove and retain the two Locking Rings from the 10 MHz In and 1 PPS In BNC connectors using the Knurled Nut Tool. See [Figure 3.1.5 on page 3.1.38](#).

Figure 3.1.4: Cable Disconnections*Figure 3.1.5: BNC Connector Removal*

13. From the rear of the transmitter, remove and retain the two silver push button connector lock ("push" lever) from the AES/EBU XLR connectors. Follow the manufacturer's instructions in [Figure 3.1.6](#) to remove the push button. You will need access to the front and rear of the receptacle to remove it by pressing on the lock button while pressing the lock outwards from inside the transmitter using the push lever removal tool (Nautel Part # HAS78, found in the ancillary kit).

Figure 3.1.6: XLR Connector Lock Removal



14. Remove and retain the four #4 screws securing the two XLR connectors.
15. Remove and retain the six M3 screws securing the Exciter PWB.
16. Slide the Exciter PWB towards the front of the transmitter and lift the Exciter PWB out.
17. Obtain a replacement Exciter PWB (Nautel part # NAPE90*).
18. Remove the Push Button Connector Locks from the new Exciter PWB (if present).
19. Install the Exciter PWB by reversing [Step 4](#) to [Step 16](#). Torque all hardware to 6 in-lbs (0.68 N-m).
20. Re-install the SD card retained in [Step 5](#).
21. Install the Push Button Connector Locks into the XLR connectors.
22. Return the transmitter to operation.

Analog Audio PWB Replacement

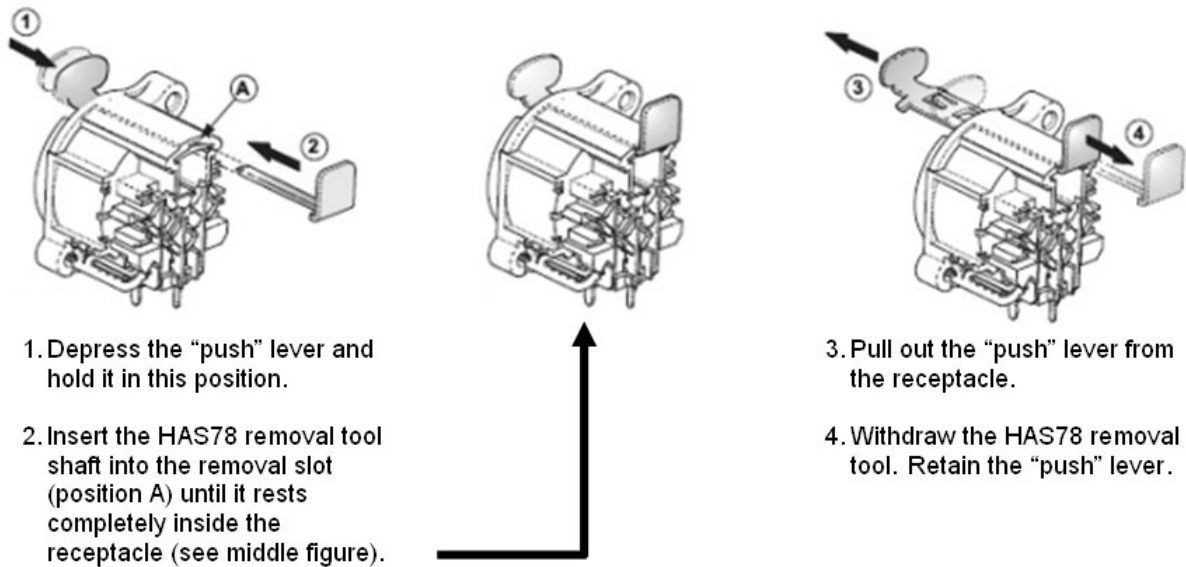
CAUTION! The Analog Audio PWB is static sensitive and must be handled in a static protected manner.

NOTE: *The USB provided with the transmitter contains videos (mp4 format) that support the replacement procedures in this section. Go to the USB's HOME screen and click VIDEOS. Videos for replacing LRUs are listed in the Maintenance section.*

See MD-1 or MD-2 and MD-3 in the Mechanical Drawings section of this manual.

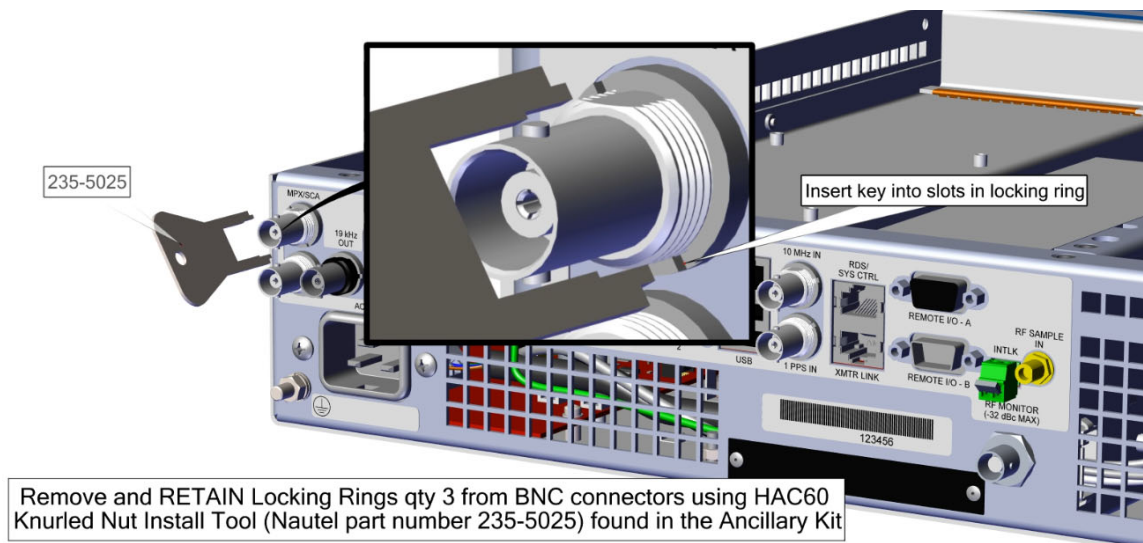
1. Turn RF off and disconnect ac power from the transmitter.
2. If applicable, remove and retain the four screws securing the transmitter in the rack.
3. Place the transmitter on a suitable workbench.
4. Remove and retain the 21 M3 screws securing the top cover. Remove cover.
5. Disconnect ribbon cable from J5 of the Analog Audio PWB.
6. Remove and retain the two M3 screws securing the Analog Audio PWB.
7. Obtain the push lever removal tool (Nautel Part # HAS78, found in the ancillary kit).
8. From the rear of the transmitter, remove and retain the two silver push button connector lock ("push" lever) from the AES/EBU XLR connectors. Follow the manufacturer's instructions in [Figure 3.1.7 on page 3.1.41](#) to remove the push button. You will need access to the front and rear of the receptacle to remove it by pressing on the lock button while pressing the lock outwards from inside the transmitter using the push lever removal tool.

Figure 3.1.7: XLR Connector Lock Removal



9. Remove and retain the four #4 screws near the ANALOG AUDIO connectors on the rear panel.
10. Remove and retain the three locking rings from three BNC connectors (two MPX/SCA and one 19 kHz OUT) using the Knurled Nut Tool (Nautel Part # 235-5025), found in the ancillary kit. See [Figure 3.1.8](#).

Figure 3.1.8: BNC Connector Removal



11. Remove the Analog Audio PWB from the transmitter.

12. Obtain the replacement Analog Audio PWB (Nautel Part # NAPI189).
13. Remove the Push Button Connector Locks from the new Analog Audio PWB (if present).
14. Install the Analog Audio PWB by reversing [Step 4](#) to [Step 11](#). Torque all hardware to 6 in-lbs (0.68 N-m).
15. Install the Push Button Connector Locks into the XLR connectors.
16. Return the transmitter to operation.

PA Power Supply Replacement

WARNING! Lethal voltages exist inside the transmitter when the power is turned on. Follow replacement instructions carefully to ensure safety for maintenance personnel during power supply replacement.

NOTE: The USB provided with the transmitter contains videos (mp4 format) that support the replacement procedures in this section. Go to the USB's HOME screen and click VIDEOS. Videos for replacing LRUs are listed in the Maintenance section.

Figure 3.1.9: Location of PA Power Supply

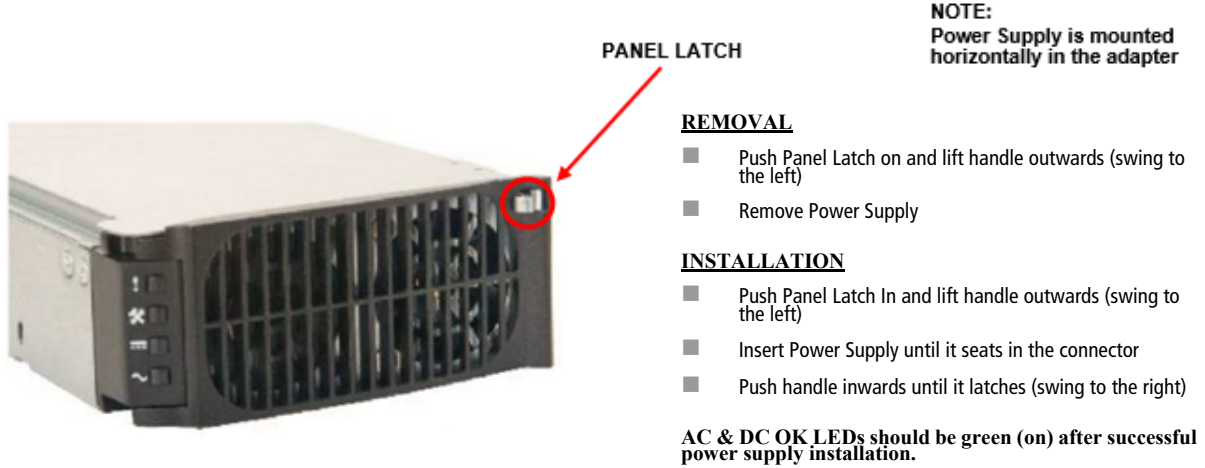


NOTE: The PA Power Supply is hot-swappable, meaning there is no need to turn RF off or disconnect ac power from the transmitter.

1. From the front of the transmitter, locate the PA Power Supply. See [Figure 3.1.9](#)
2. Using [Figure 3.1.10 on page 3.1.44](#) as a guide, remove the PA Power Supply from the front of the transmitter.
3. Locate or obtain a replacement PA Power Supply (Nautel Part # UG132 for VX150/VX300/VX600 or UG136 for VX1/VX1.5/VX2).
4. Using [Figure 3.1.10 on page 3.1.44](#) as a guide, reinstall the new PA Power Supply.
5. Verify that the AC OK LED on the front of the PA Power Supply are solid green. If the transmitter is RF ON (and not inhibited) then the DC OK LED should also be lit solid green.

NOTE: The Power Supply FAULT LED (red) may blink temporarily until communication is established between the power supply and the transmitter.

6. The transmitter should resume normal operation and the alarm should clear.

Figure 3.1.10: Removal of PA Power Supply

Power Supply (+12 V) Replacement

NOTE: *The USB provided with the transmitter contains videos (mp4 format) that support the replacement procedures in this section. Go to the USB's HOME screen and click VIDEOS. Videos for replacing LRUs are listed in the Maintenance section.*

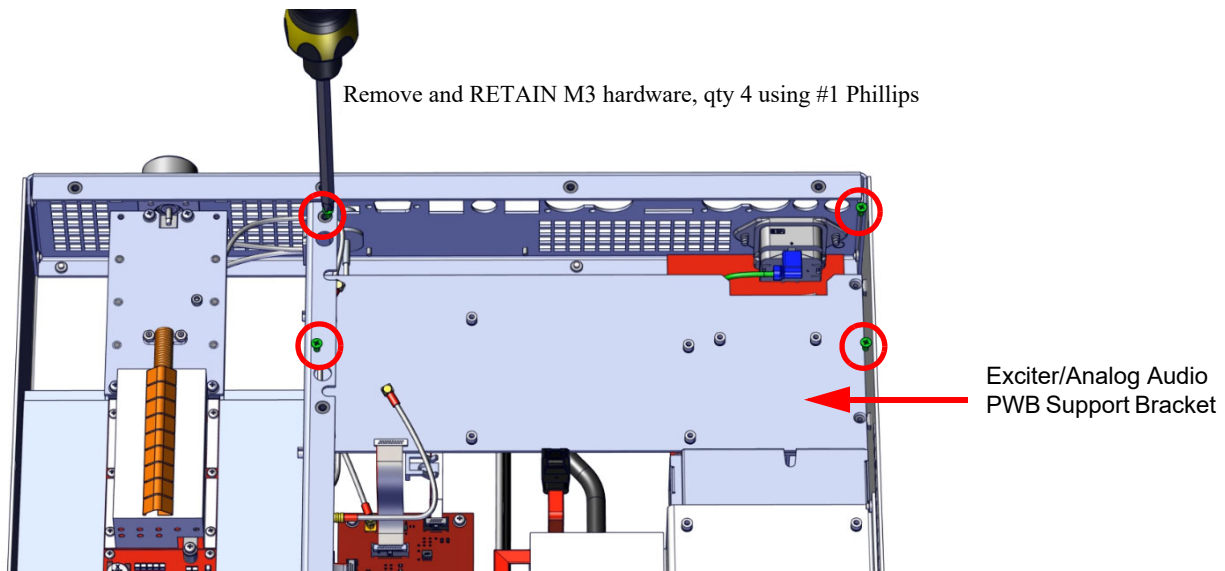
NOTE: *The Exciter PWB, Analog Audio PWB and Exciter/Analog Audio PWB Support Bracket (Nautel part # 235-8227) must be removed prior to replacing the Power Supply (+12 V). Refer to [Exciter PWB Replacement - see page 3.1.37](#) and [Analog Audio PWB Replacement - see page 3.1.40](#) for instructions.*

See MD-1 or MD-2 in the Mechanical Drawings section of this manual to locate the power supply.

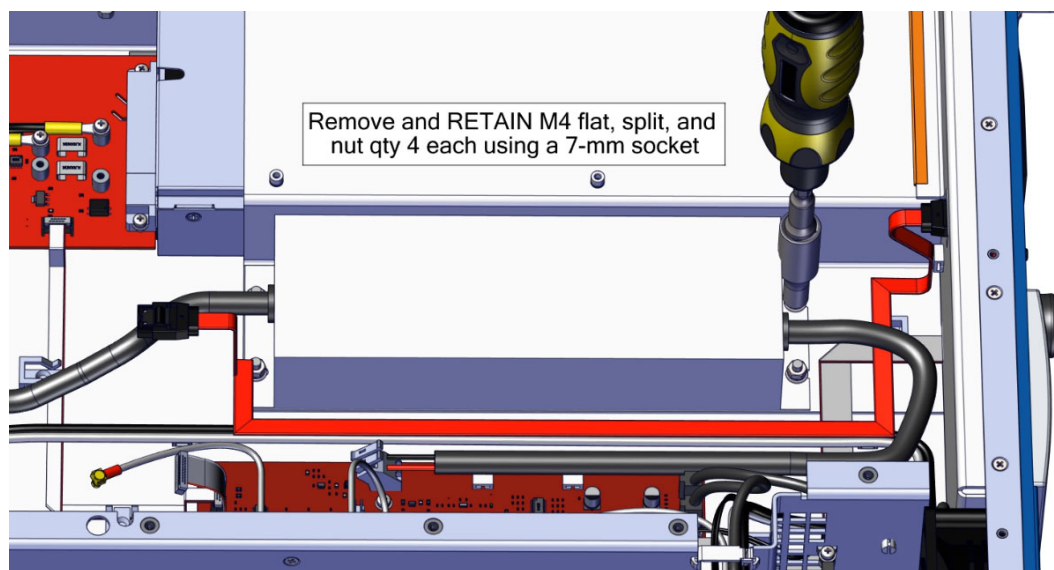
1. Turn RF off and disconnect ac power from the transmitter.
2. If applicable, remove and retain the four screws securing the transmitter in the rack.
3. Place the transmitter on a suitable workbench.
4. Remove and retain the 21 M3 screws securing the top cover. Remove cover.
5. Remove the Exciter PWB as per [Exciter PWB Replacement - see page 3.1.37](#).

NOTE: *The SD card does not need to be removed for this procedure.*

6. Remove the Analog Audio PWB as per [Analog Audio PWB Replacement - see page 3.1.40](#).
7. Remove and retain the four M3 screws securing the Exciter/Analog Audio PWB Support Bracket and remove. See [Figure 3.1.11 on page 3.1.46](#).

Figure 3.1.11: Exciter/Analog Audio PWB Support Bracket Screws

8. Disconnect wiring from TB1 on the Power Supply Interface PWB (A4, NAPI188*), noting connections. Cut cable ties securing wiring.
9. Disconnect wiring from TB2 on the System Interface PWB (A3, NAPI187), noting connections. Cut cable ties securing wiring.
10. Remove and retain the four sets of M4 hardware securing the power supply to the chassis using a 7-mm nut driver. See [Figure 3.1.12](#). Note power supply orientation.

Figure 3.1.12: Power Supply Securing Hardware

11. Obtain a replacement power supply (Nautel part # UG130).
12. Install the power supply by reversing [Step 8](#) to [Step 10](#). Torque hardware to 6 in-lbs (0.68 N-m).
13. Secure wiring with new cable ties (Nautel Part # HT77, found in the ancillary kit).
14. Re-install the Exciter/Analog Audio PWB Support Bracket (Nautel part # 235-8227).
15. Re-install the Exciter and Analog Audio PWBs.
16. Return the transmitter to operation.

Cooling Fan Replacement

NOTE: The USB provided with the transmitter contains videos (mp4 format) that support the replacement procedures in this section. Go to the USB's HOME screen and click VIDEOS. Videos for replacing LRUs are listed in the Maintenance section.

See MD-1 or MD-2 in the Mechanical Drawings section of this manual.

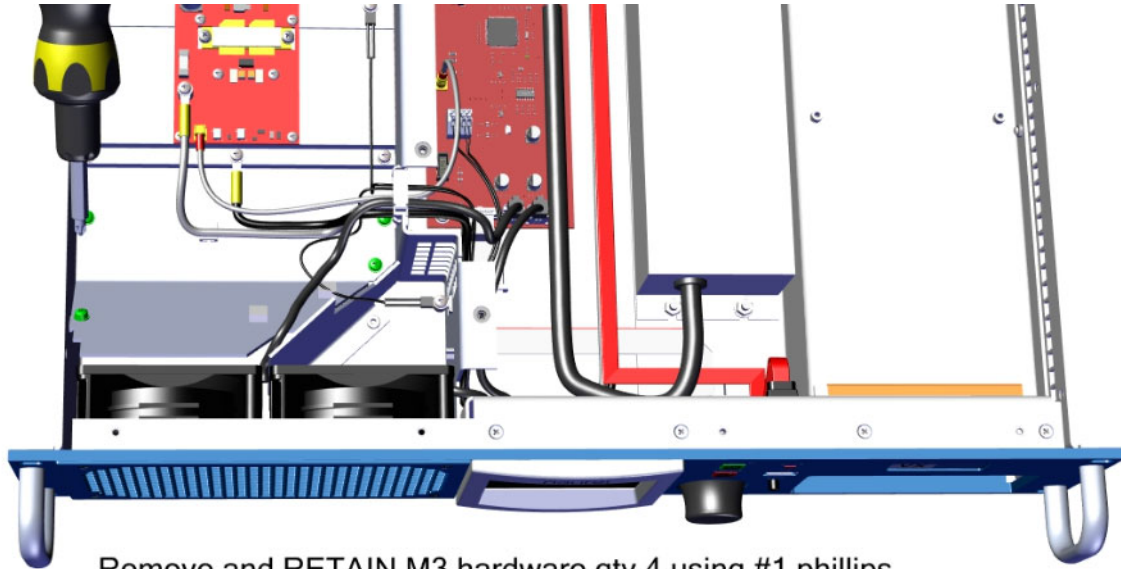
1. Turn RF off and disconnect ac power from the transmitter.
2. If applicable, remove and retain the four screws securing the transmitter in the rack.
3. Place the transmitter on a suitable workbench.
4. Remove the PA Power Supply as described in [PA Power Supply Replacement on page 3.1.43](#).
5. Remove and retain the 21 M3 screws securing the top cover. Remove cover.
6. From the bottom of the transmitter, remove and retain the two M3 screws securing the Fan Splitter, see [Figure 3.1.13](#).

Figure 3.1.13: Fan Splitter M3 Screw Removal on bottom of Transmitter

Remove and RETAIN M3 hardware qty 2 using #1 phillips



7. From the top of the transmitter, use small side cutters to cut the cable ties securing the fan wiring.
8. Remove and retain the four M3 screws securing the Air Deflector. See [Figure 3.1.14 on page 3.1.49](#).

Figure 3.1.14: Removal of Air Deflector M3 screws

Remove and RETAIN M3 hardware qty 4 using #1 phillips

9. Carefully tilt the Heatsink Air Deflector to allow the Fan Splitter to be removed, being careful not to pinch or strain the cabling. See [Figure 3.1.15](#) and [Figure 3.1.16 on page 3.1.50](#).

Figure 3.1.15: Tilting of Heatsink Air Deflector

Carefully shift heatsink air deflector so as not to pinch or strain cables

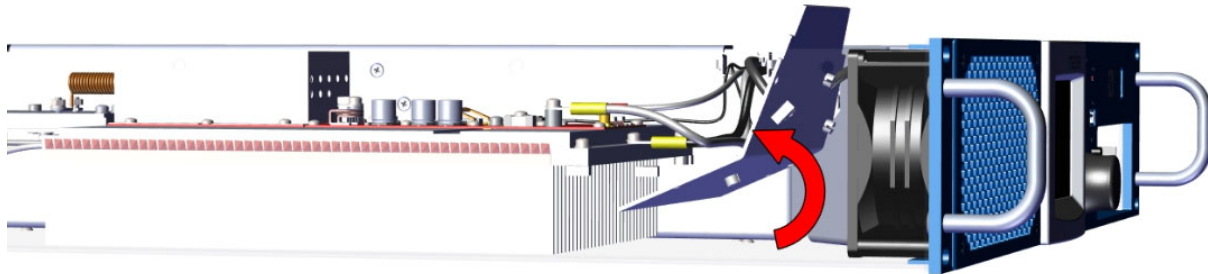
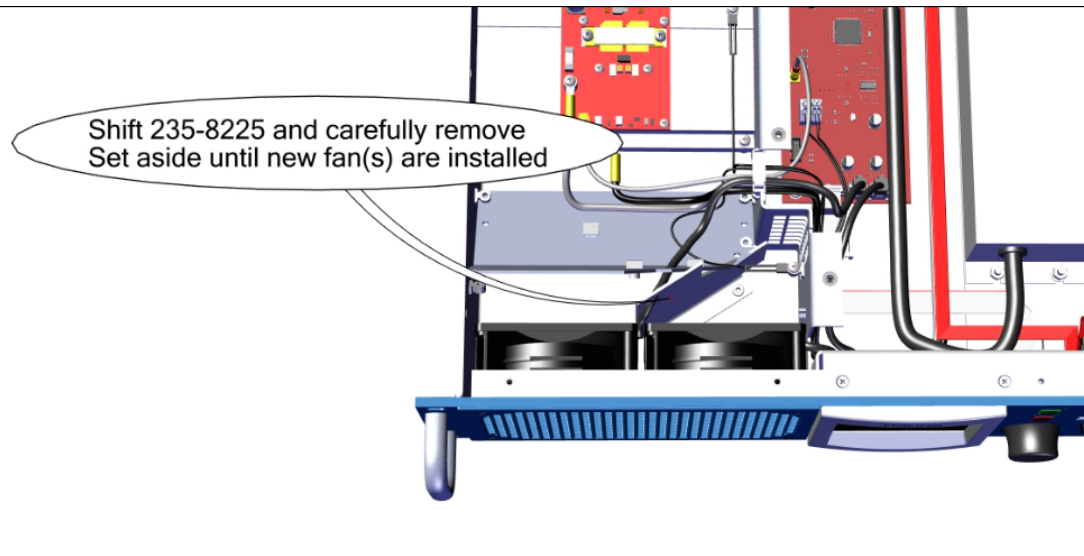
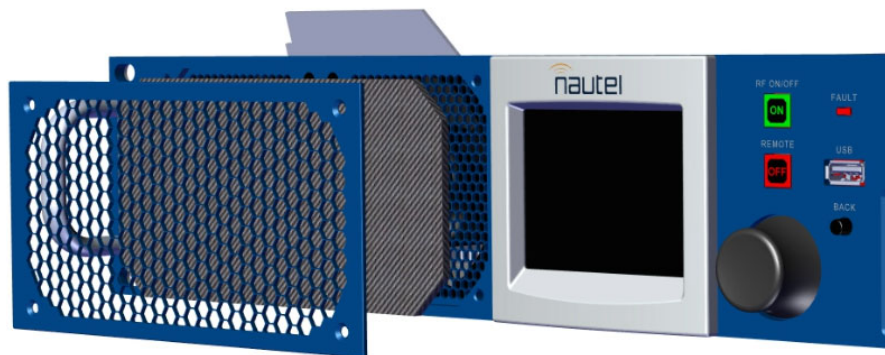


Figure 3.1.16: Fan Splitter Removal

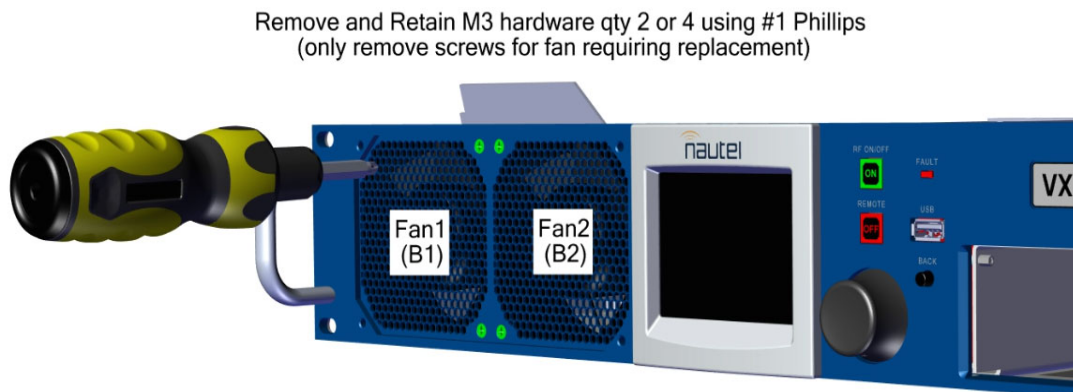
10. Remove and retain the four M3 screws securing the Filter Securing Panel and filter media. See [Figure 3.1.17](#).

Figure 3.1.17: Air Filter and Media Bracket Removal

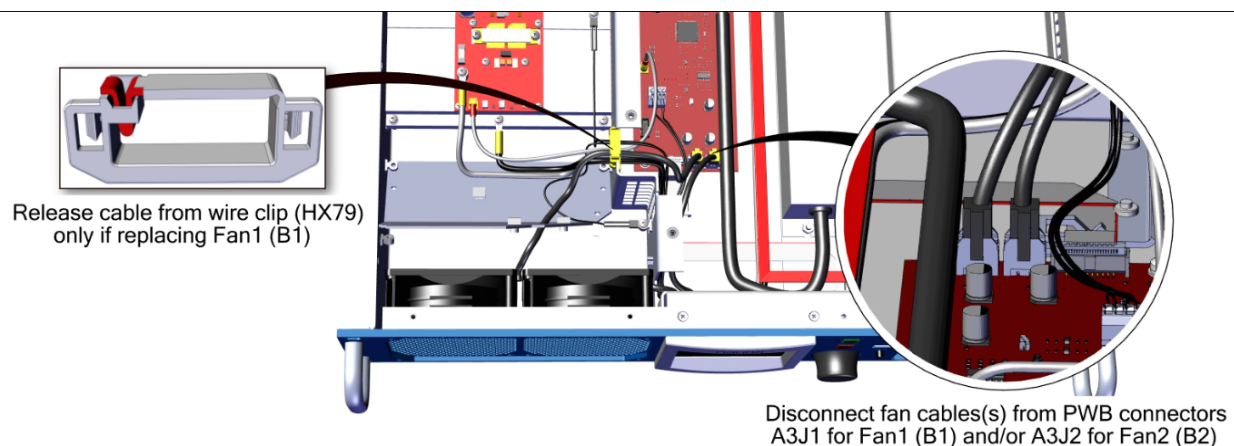
Remove Filter Securing Panel (HU82C) and Filter
Set aside until reassembly



11. Remove and retain the M3 screws (only two per fan) securing the defective fan. See [Figure 3.1.18](#) on page 3.1.51.

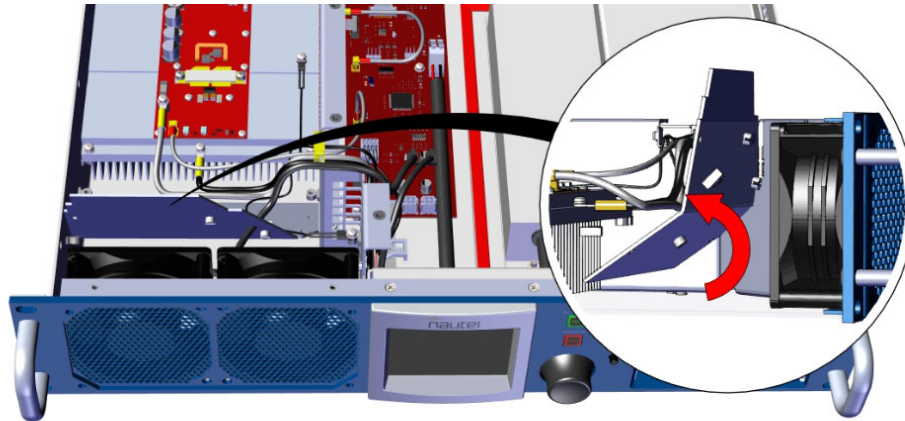
Figure 3.1.18: Fan Securing Screw Removal

12. If replacing Fan B1 only, release the fan cable from the Wire Clip. Disconnect fan cable B1-A3J1 and/or B2-A3J2 from the System Interface PWB. See [Figure 3.1.19](#).

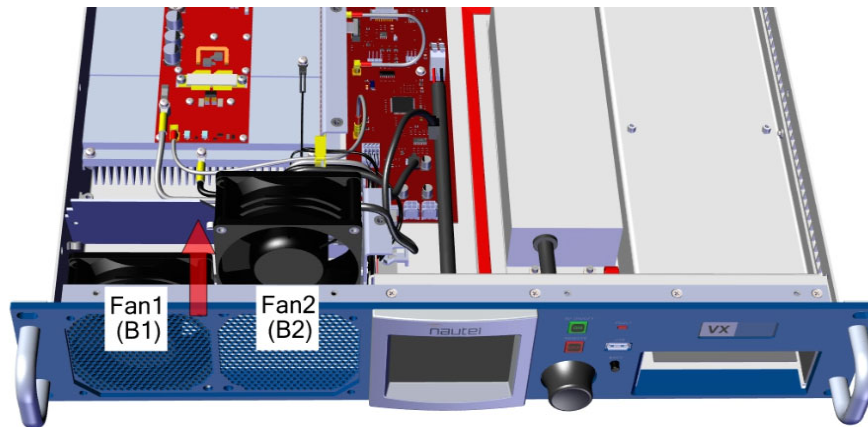
Figure 3.1.19: Disconnecting Fan Wiring

13. Move the fan away from the Air Deflector and lift up to remove Fan B1 or B2, as required. See [Figure 3.1.20 on page 3.1.52](#) and [Figure 3.1.21 on page 3.1.52](#).

CAUTION! Fold back the Air Deflector to not damage any of the cables.

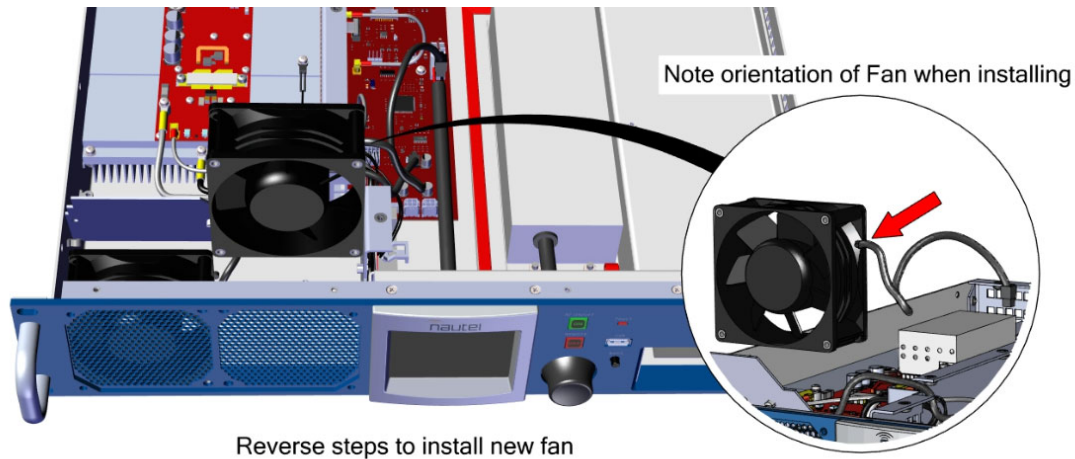
Figure 3.1.20: Air Deflector Relocation

Fold back air deflector carefully so as not to damage any of the cables

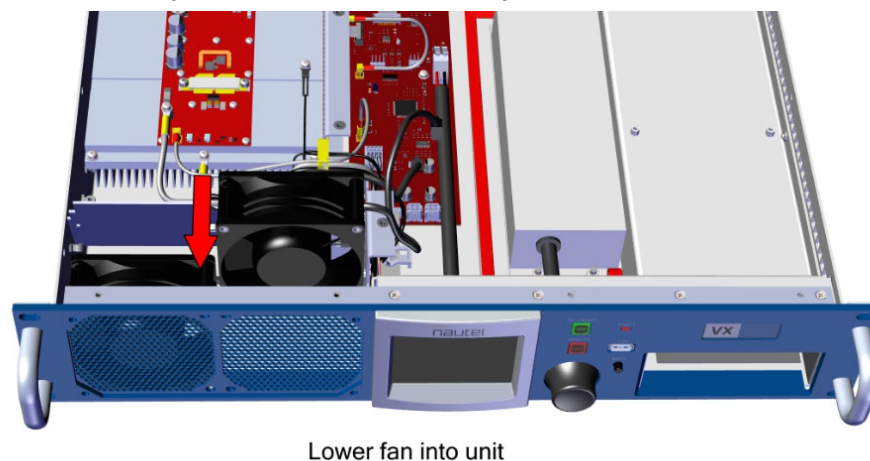
Figure 3.1.21: Fan Removal

Move fan away from flange then lift up to remove

14. Obtain the replacement fan(s) (Nautel part # ZAP68).
15. Note the orientation of the fan when installing. The Airflow indicator arrows on the fan should be pointing up and away from the front panel, such that air will be drawn in through the front panel. See [Figure 3.1.22 on page 3.1.53](#).

Figure 3.1.22: Fan Orientation

16. Fold back the Air Deflector and install the fan in the transmitter by sliding the fan under the Air Deflector. See [Figure 3.1.23](#).

Figure 3.1.23: Fan Installation (Fan B2 shown for reference)

17. Complete the Installation of the fan(s) by reversing [Step 5](#) to [Step 12](#). Use cable ties (Nautel part # HT77, found in the ancillary kit) to secure the wiring harness. Torque all M3 hardware to 6 in-lbs (0.68 N-m). Return the transmitter to operation.

Front Panel User Interface (FPUI) Display Replacement

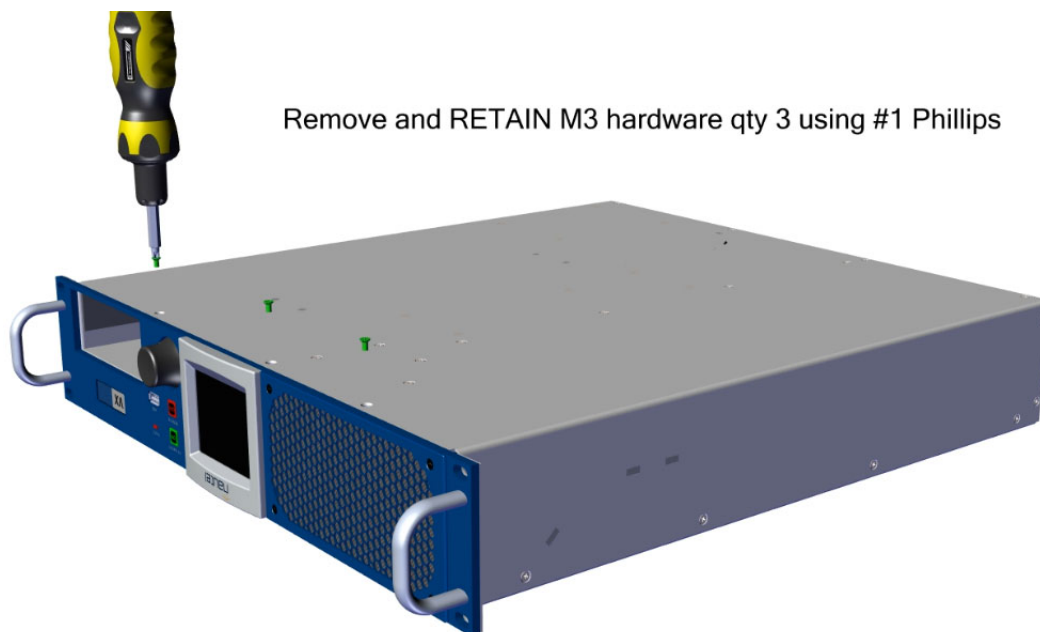
CAUTION! The FPUI Display is static sensitive and must be handled in a static protected manner.

NOTE: The USB provided with the transmitter contains videos (mp4 format) that support the replacement procedures in this section. Go to the USB's HOME screen and click VIDEOS. Videos for replacing LRUs are listed in the Maintenance section.

See MD-1 or MD-2 and MD-7 in the Mechanical Drawings section of this manual.

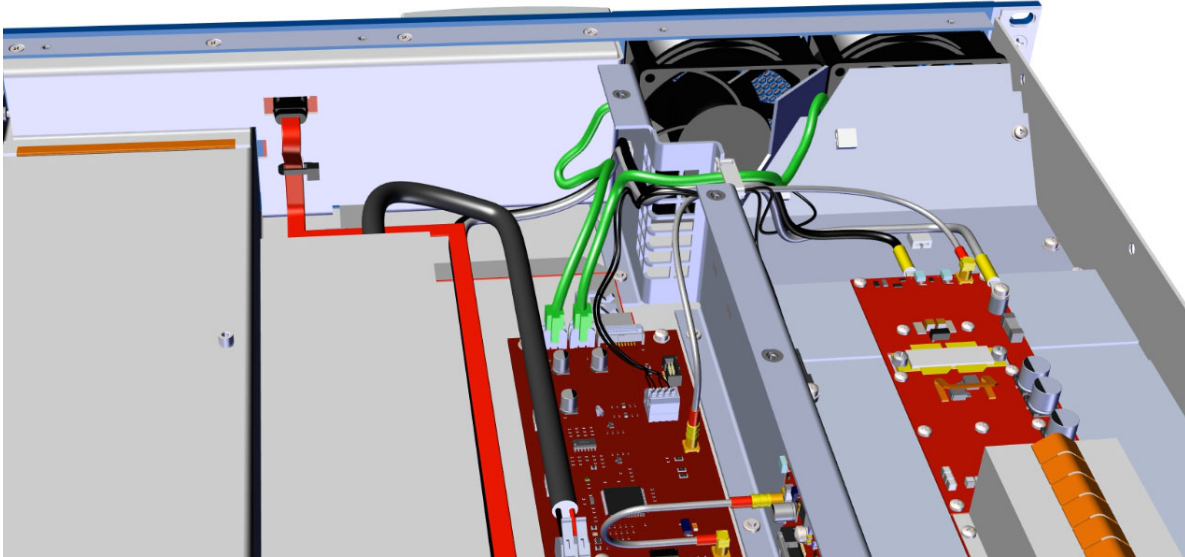
1. Turn RF off and disconnect ac power from the transmitter.
2. If applicable, remove and retain the four screws securing the transmitter in the rack.
3. Place on a suitable workbench.
4. Remove the PA Power Supply (U3) by pushing the panel latch to the right to unlock and slide power supply out. Refer to [Analog Audio PWB Replacement - see page 3.1.40](#).
5. Remove and retain the 21 M3 screws securing the top cover. Remove cover.
6. From the bottom of the transmitter, remove and retain the three M3 screws. See [Figure 3.1.24](#).

Figure 3.1.24: M3 Screw Removal on bottom of Transmitter



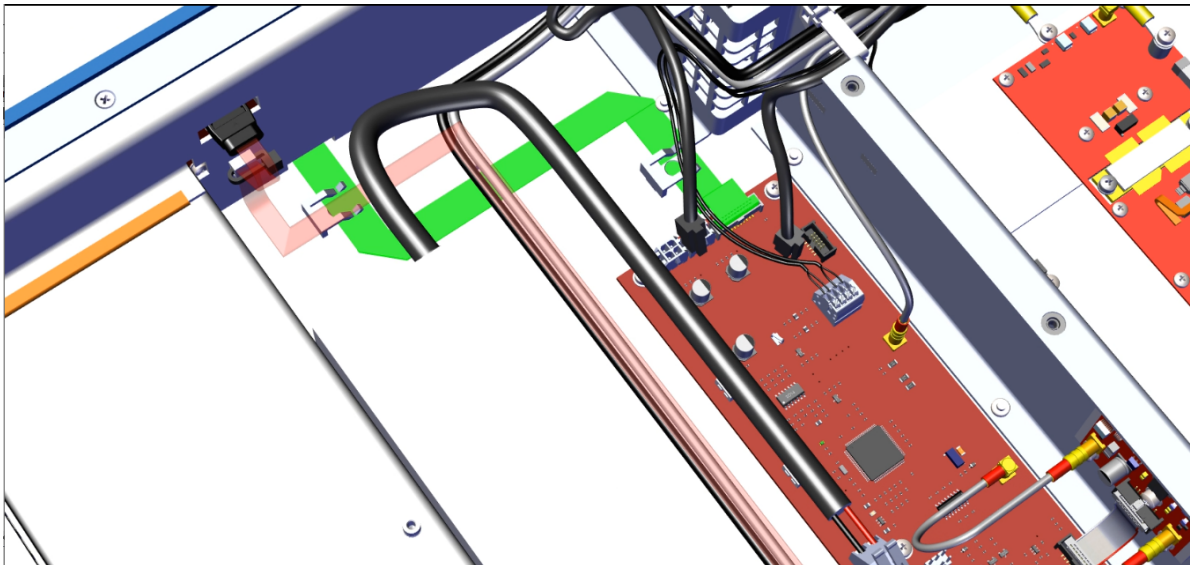
7. Disconnect the fan wiring, noting connections. See [Figure 3.1.25](#).

Figure 3.1.25: Fan Wiring Removal



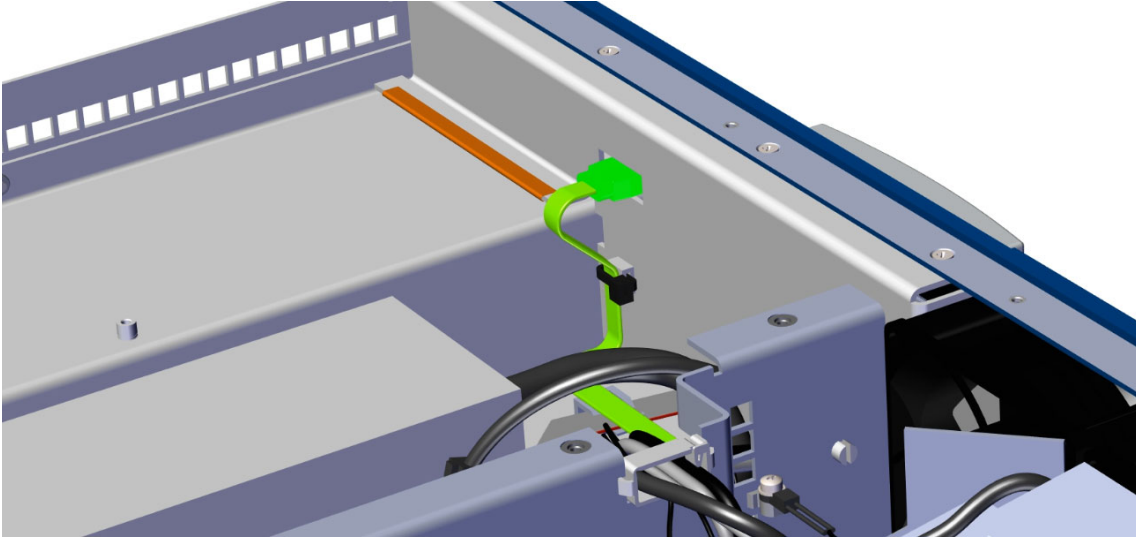
8. Disconnect the ribbon cable from J3 on the System Interface PWB (A3) and unhook from its securing clamps. See [Figure 3.1.26](#).

Figure 3.1.26: Ribbon Cable Disconnect



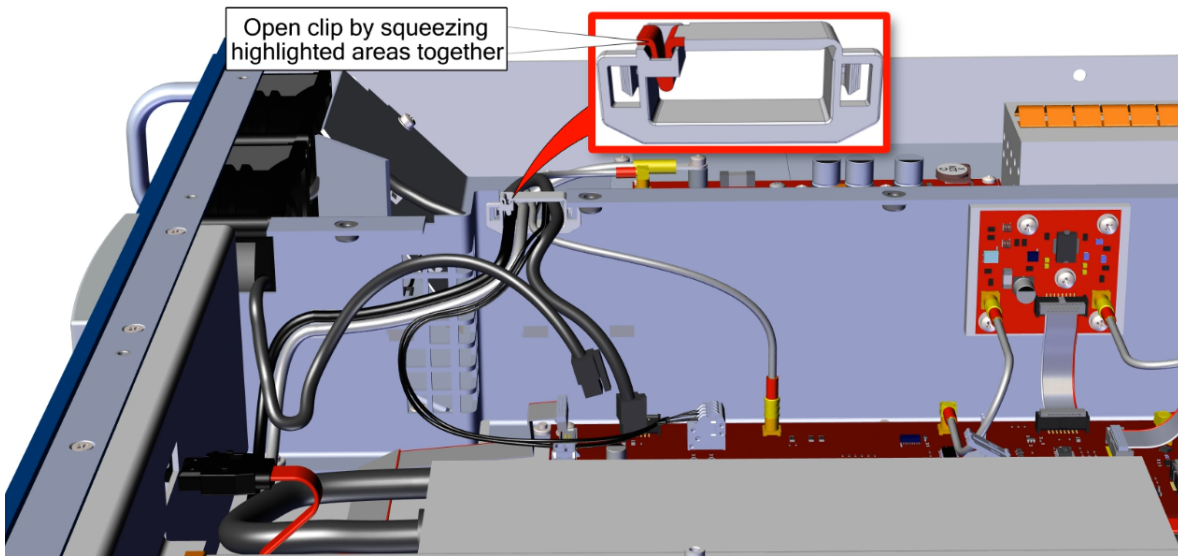
9. Cut the securing cable tie and disconnect cable from FPUI Display. See [Figure 3.1.27](#).

Figure 3.1.27: FPUI Cable Disconnect



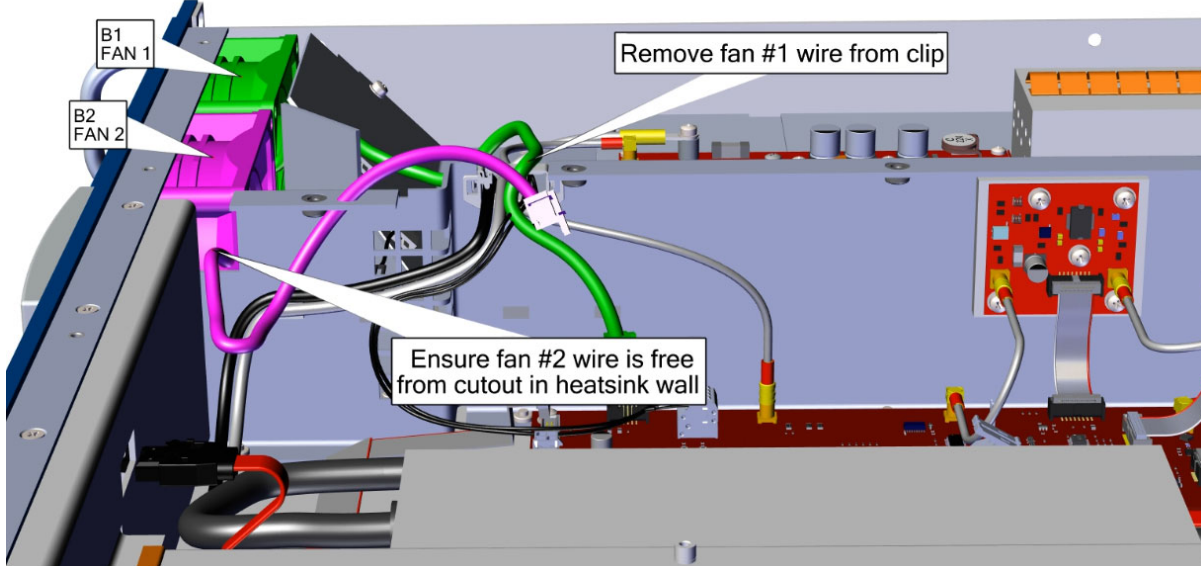
10. Release the Fan wiring securing clamp by squeezing the clamp together. See [Figure 3.1.28](#).

Figure 3.1.28: Fan Wiring Securing Clamp



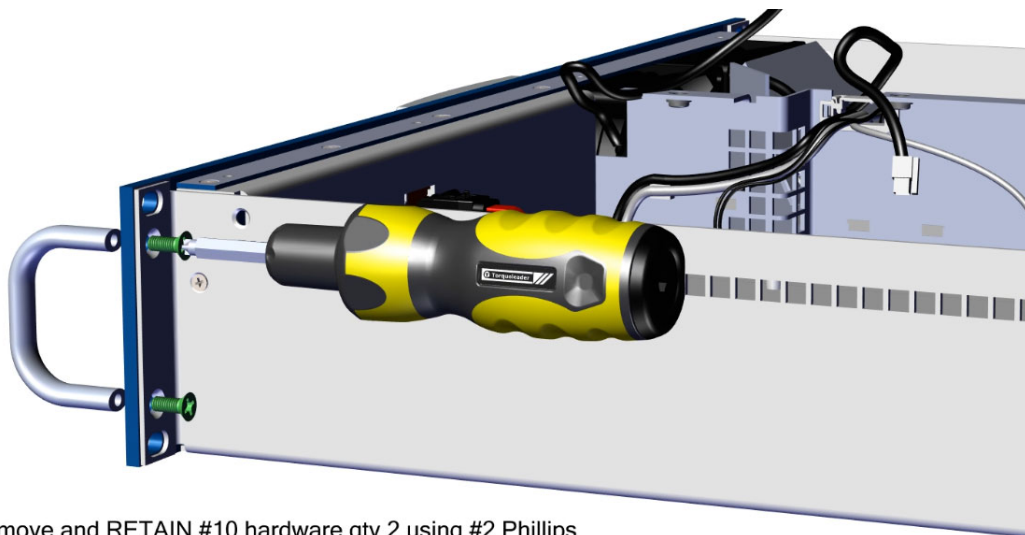
11. Move the fan wiring to allow FPUI Display removal. See [Figure 3.1.29](#).

Figure 3.1.29: Fan Wiring Removal



12. Remove and retain the four #10 screws (two per side) securing the front panel. See [Figure 3.1.30](#). Remove front panel.

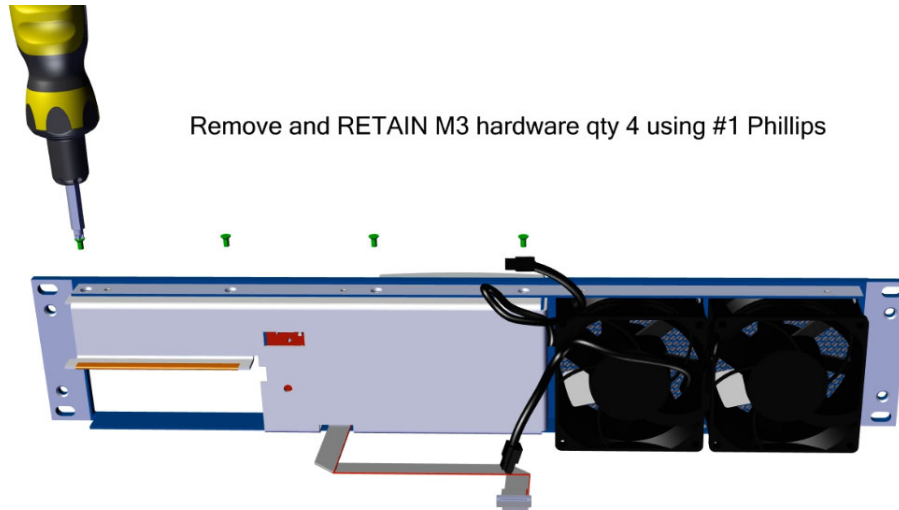
Figure 3.1.30: Front Panel Removal



Remove and RETAIN #10 hardware qty 2 using #2 Phillips

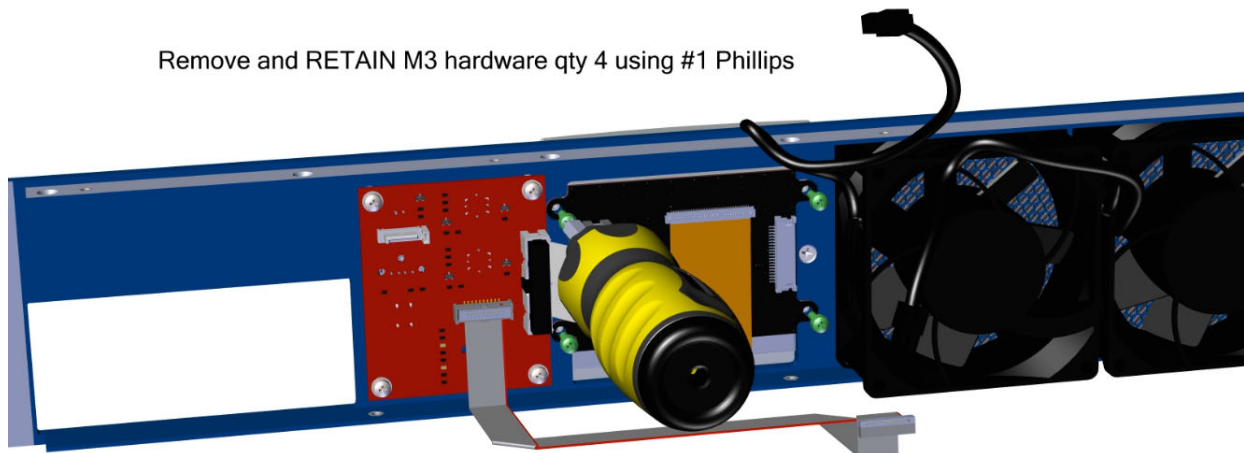
13. Remove and retain the four M3 screws securing the FPUI bracket to the front panel. See [Figure 3.1.31](#).

Figure 3.1.31: FPUI Bracket Removal



14. Remove the FPUI bracket.
15. Disconnect the FPUI ribbon cable and four M3 screws securing the FPUI display to the front panel. Retain screws. See [Figure 3.1.32](#).

Figure 3.1.32: Ribbon Cable and Securing Screw Removal



16. Remove the FPUI Display.
17. Obtain a replacement LCD Display (Nautel part # UR119).

18. Remove the protective film from the display. Observe Precautions. See [Figure 3.1.33](#) and [Figure 3.1.34](#).

Figure 3.1.33: Display Handling Precautions

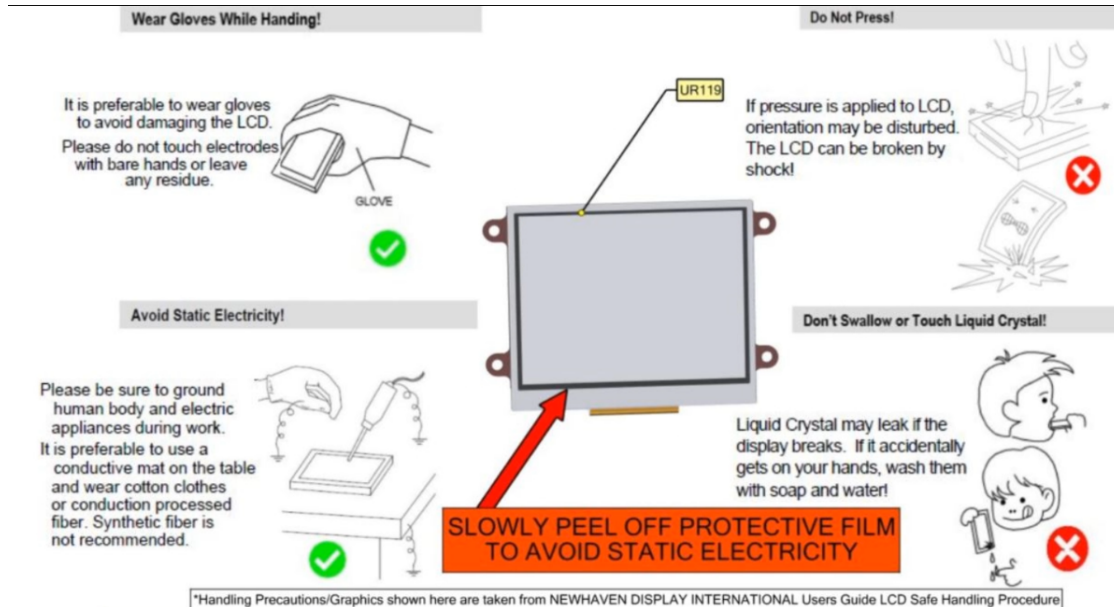
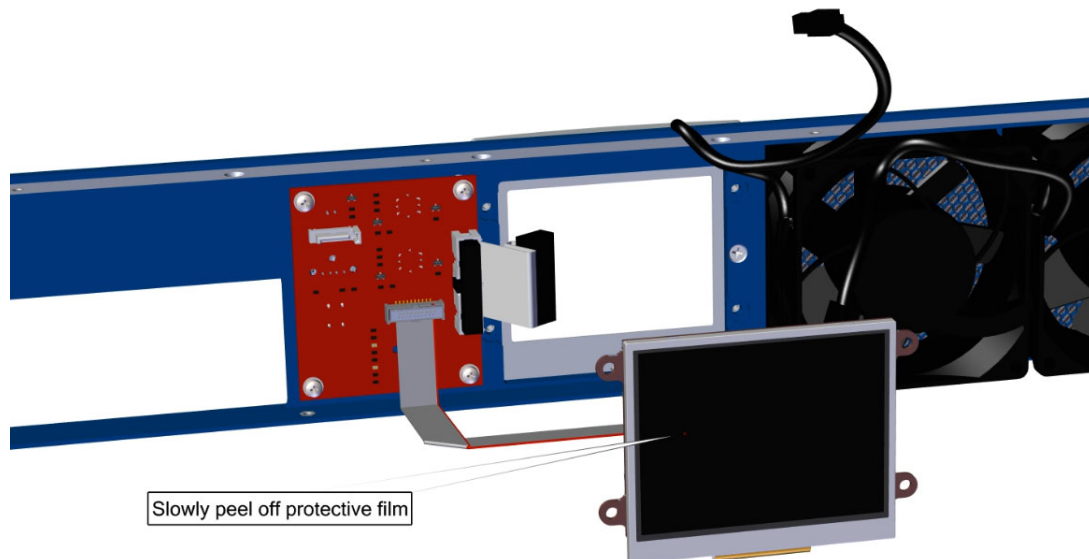


Figure 3.1.34: Protective Film Removal



19. Complete the Installation of the FPUI Display by reversing [Step 4](#) to [Step 15](#). Torque all metric hardware to 6 in-lbs (0.68 N-m). Torque the #10 screws to 10 in-lbs (1.1 N-m). Replacement cable ties (Nautel part # HT77) can be found in the ancillary kit. Return the transmitter to operation.

Power Amplifier PWB Replacement

CAUTION! The Power Amplifier PWB is static sensitive and must be handled in a static protected manner.

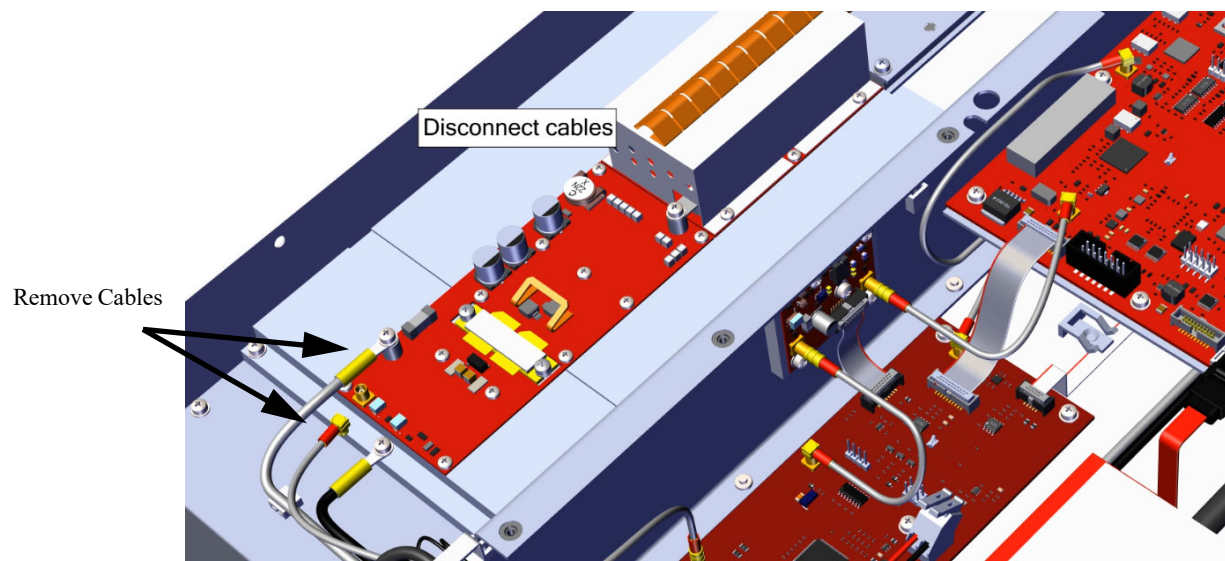
NOTE: The USB provided with the transmitter contains videos (mp4 format) that support the replacement procedures in this section. Go to the USB's HOME screen and click VIDEOS. Videos for replacing LRUs are listed in the Maintenance section.

See MD-1 or MD-2 and MD-9 in the Mechanical Drawings section of this manual.

NOTE: For VX1.5 /VX2 transmitters, refer to Mechanical Drawing MD-2 to determine the location of PA1 and PA2.

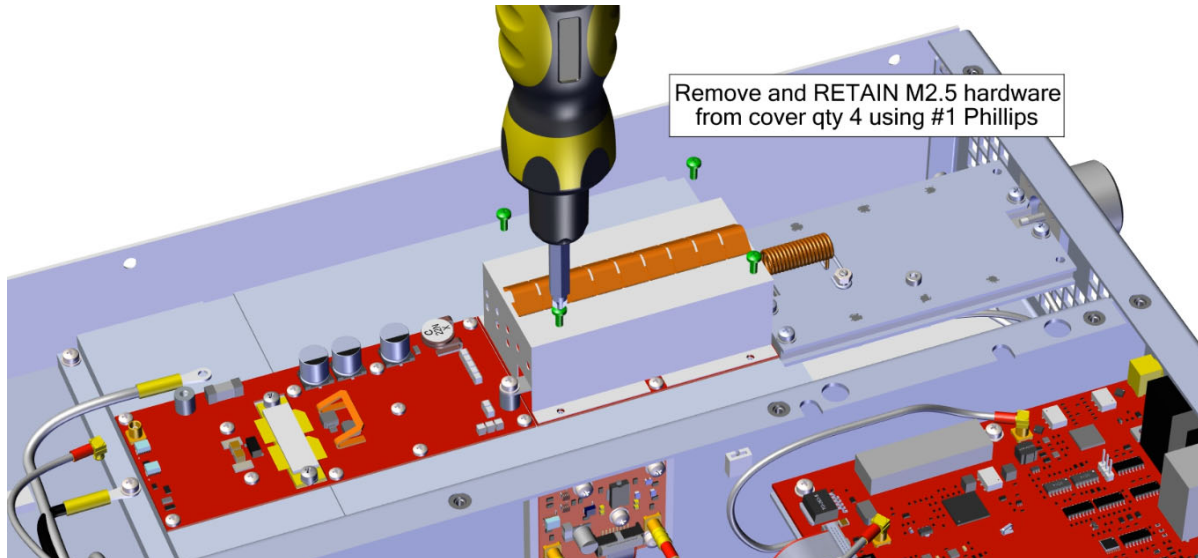
1. Turn RF off and disconnect ac power from the transmitter.
2. If applicable, remove and retain the four screws securing the transmitter in the rack.
3. Place the transmitter on a suitable workbench.
4. Remove and retain the 21 M3 screws securing the top cover. Remove cover.
5. Disconnect the two cables connected to the PA (PA Volts from E1 and RF Drive from J1). Discard the M3 screw attached to E1. See [Figure 3.1.35](#).

Figure 3.1.35: PA Cable Removal



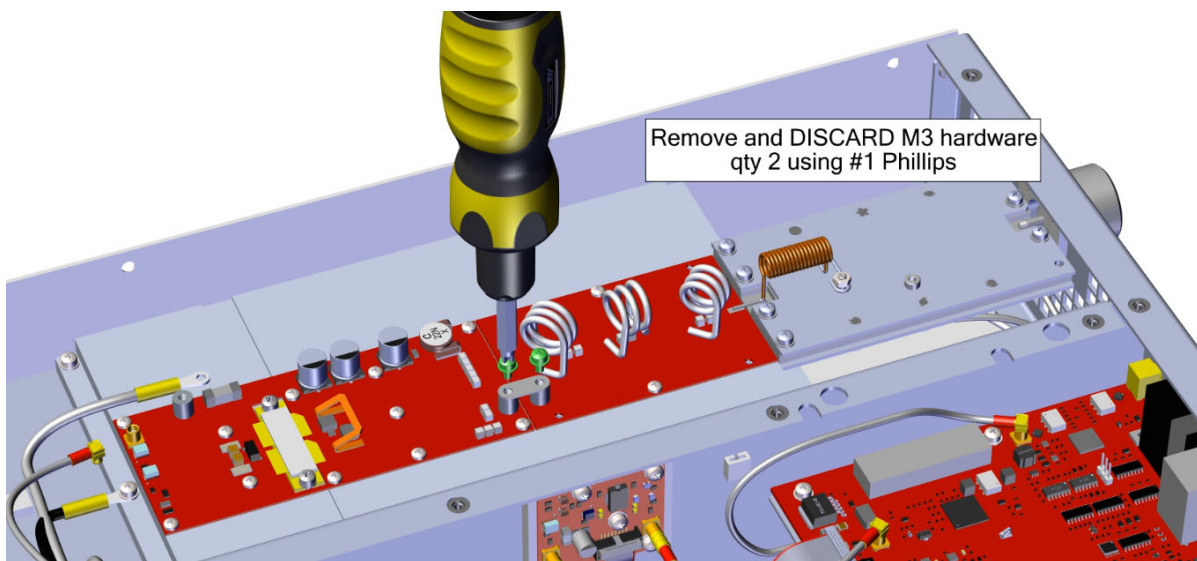
6. Remove and retain the four M2.5 screws securing the Filter Cover and remove the cover. See [Figure 3.1.36](#).

Figure 3.1.36: Filter Cover Removal



7. Remove and discard the two M3 screws securing the jumper between the Filter and the PA PWB. See [Figure 3.1.37](#).

Figure 3.1.37: PA PWB to Filter Connection



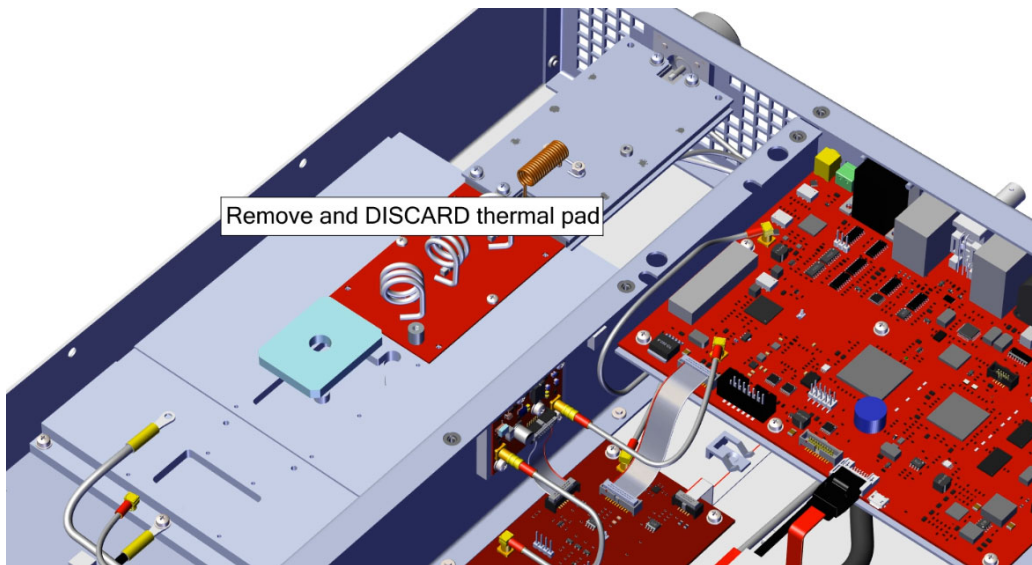
8. Remove and retain the jumper.

9. Remove and retain the 11 M2.5 screws securing the PA PWB to the heatsink.
10. Remove and discard the two M3 screws securing the FET to the heatsink.

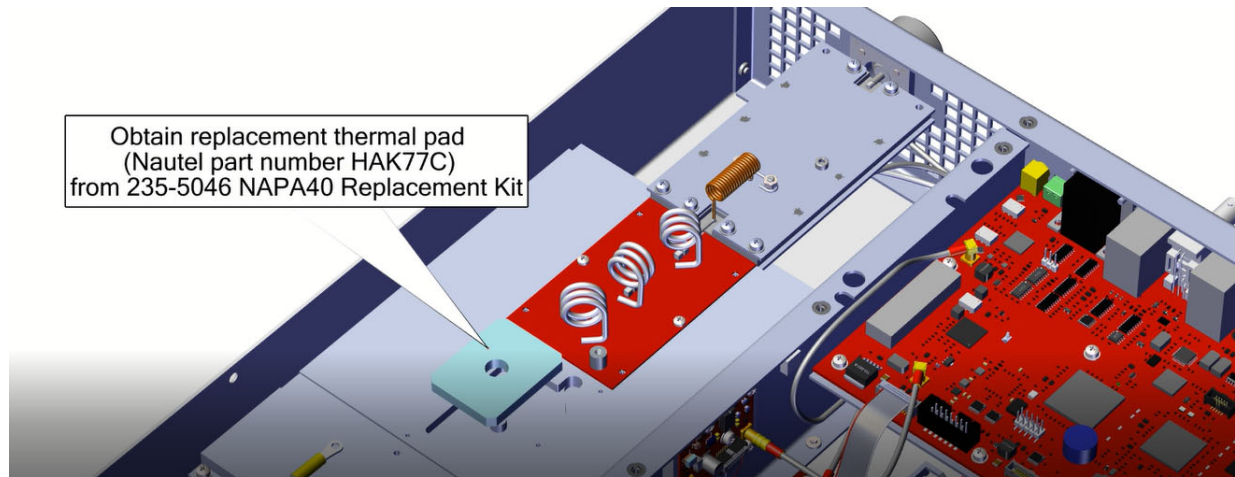
NOTE: *The LPF end of the PA PWB may require prying to break the seal from the underlying thermal pad.*

11. Remove the PA PWB and thermal pad and discard. See [Figure 3.1.38](#).

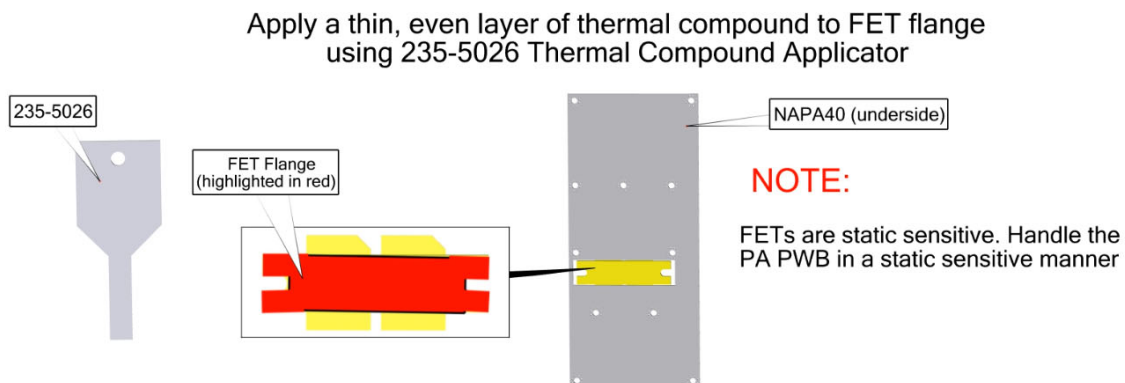
Figure 3.1.38: Thermal Pad Removal



12. Clean the heatsink of any residual thermal compound where the FET attaches to the heatsink. Use isopropyl alcohol and a microfiber cloth.
13. Obtain the replacement thermal pad (Nautel part # HAK77C) from the 235-5046* NAPA40* Replacement Kit.
14. Install the thermal pad into the cavity in the heatsink. See [Figure 3.1.39 on page 3.1.63](#).

Figure 3.1.39: Thermal Pad Installation

15. Obtain the replacement PA PWB (Nautel part # NAPA40*), thermal compound (Nautel part # HAG80) and thermal compound applicator (Nautel part # 235-5026) from the 235-5046* NAPA40* Replacement Kit.
16. Apply a thin, even layer of thermal compound to the FET flange using the thermal compound applicator. See [Figure 3.1.40](#).

Figure 3.1.40: PA PWB Thermal Compound Application

17. Seat PA PWB using small downward pressure.
18. Loosely secure the PA PWB to the heatsink using the retained eleven M2.5 screws. **Do not tighten screws at this time.**
19. Obtain two replacement M3 screws (Nautel part # HMSP59F) from the 235-5046* NAPA40* Replacement kit to secure the FET to the PA PWB.

-
20. Secure the FET by alternate tightening the left and right M3 screws on the FET until 6 in-lbs (0.68 N-m) is reached. Tighten the 11 M2.5 screws to 6 in-lbs (0.68 N-m).

CAUTION! When installing FET securing hardware, you can damage the FET case if you fully tighten one screw while the other is loose. Avoid this by alternately tightening the two screws.

21. Complete the PA PWB installation by reversing [Step 2](#) to [Step 9](#). Use three M3 screws (Nautel part # HMSP08F) from the PA Replacement kit Torque for securing E1 and the jumper. Torque all hardware to 6 in-lbs (0.68 N-m).

NOTE: *Replacement M2.5 PA screws (Nautel part # HMSP01) are provided in the NAPA40* Replacement Kit, if required.*

22. Return the transmitter to operation.

Pre-Amplifier/IPA PWB Replacement

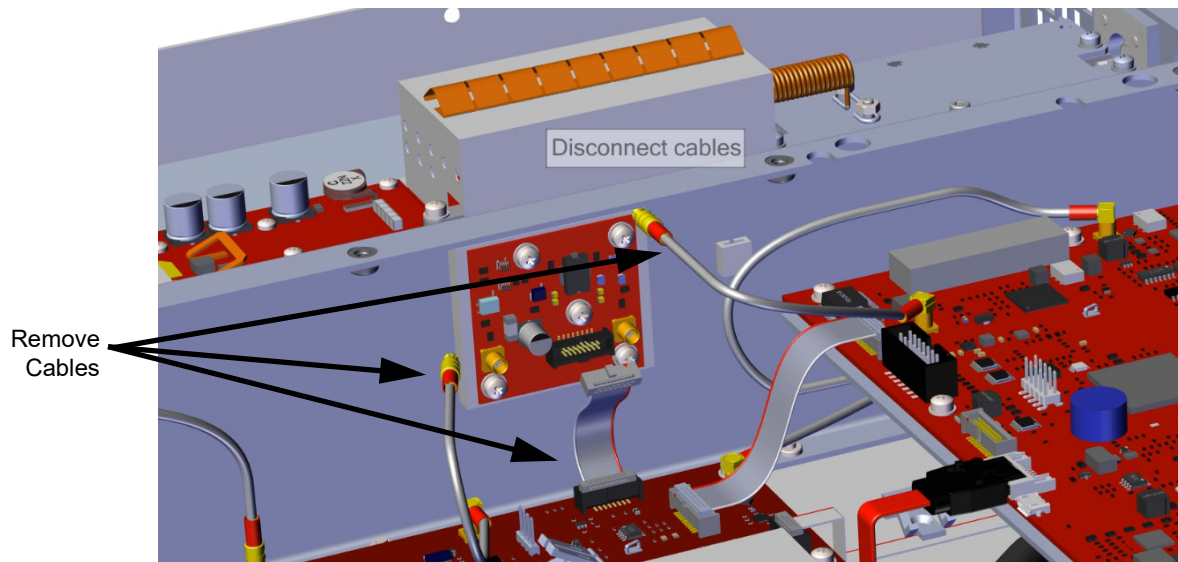
CAUTION! The Pre-Amplifier/IPA PWB is static sensitive and must be handled in a static protected manner.

NOTE: The USB provided with the transmitter contains videos (mp4 format) that support the replacement procedures in this section. Go to the USB's HOME screen and click VIDEOS. Videos for replacing LRUs are listed in the Maintenance section.

See MD-1 or MD-2 and MD-8 in the Mechanical Drawings section of this manual.

1. Turn RF off and disconnect ac power from the transmitter.
2. If applicable, remove and retain the four screws securing the transmitter in the rack.
3. Place the transmitter on a suitable workbench.
4. Remove and retain the 21 M3 screws securing the top cover. Remove the cover.
5. Disconnect the three cables connected to the IPA PWB (RF Input from J1, RF Output from J2, and ribbon cable from J3). See [Figure 3.1.41](#).

Figure 3.1.41: IPA Cable Removal



6. Remove and discard the five M3 screws securing the IPA PWB to the Mounting Block.
7. Remove the IPA PWB from the Mounting Block.

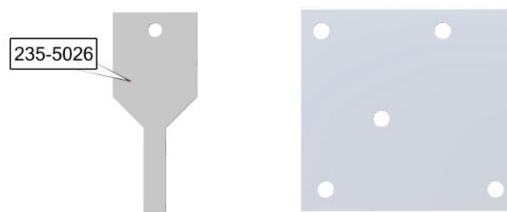
NOTE: IPA PWB removal will require breaking the seal of the thermal compound between the IPA PWB and the underlying Mounting Block.

8. Wipe off of any residual thermal compound on the mounting block.
9. Obtain the replacement IPA PWB (Nautel part # NAPA41*), thermal compound (Nautel part # HAG80) and thermal compound applicator (Nautel part # 235-5026) from the 235-5047 NAPA41 Replacement Kit.
10. Apply a thin, even layer of thermal compound to the entire backside of the IPA PWB using the thermal compound applicator. See [Figure 3.1.42](#).

CAUTION! The thermal compound is electrically conductive, so care must be take to ensure it is only on the backside of the IPA PWB.

Figure 3.1.42: IPA PWB Thermal Compound Application

Apply a thin, even layer of thermal compound to entire backside of IPA PWB using 235-5026, Thermal Compound Applicator



11. Obtain five replacement M3 screws (Nautel part # HMSP08F) from the 235-5047 NAPA41 Replacement kit.
12. Attach the IPA PWB to the Mounting Block using the five M3 screws. Torque to 6 in-lbs (0.68 N-m).
13. Complete the IPA PWB installation by reversing [Step 4](#) to [Step 5](#).
14. Return the transmitter to operation.

SECTION 3.2: PARTS INFORMATION

This section contains reference designation lists that provide descriptive and provisioning information for all electrical and mechanical parts that have an assigned reference designation and form a part of the subject equipment.

Topics in this section include:

- [Family Tree](#)
- [How to Locate Information About a Specific Part](#)
- [Column Content on page 3.2.2](#)

Family Tree

A family tree is included in this section for each of the three low power VX model classes:

- VX150/VX300/VX600 - see [Figure 3.2.1 on page 3.2.4](#)
- VX1 - see [Figure 3.2.2 on page 3.2.5](#)
- VX1.5/VX2 - see [Figure 3.2.3 on page 3.2.6](#)

The family tree is based on the descending order of the reference designation hierarchy. Included are assemblies that have a Nautel configuration control number (e.g., A2, part number NAPI189), non-repairable third-party items (e.g., U2, part number UG130), and Nautel-modified third-party items (e.g., U4, part number 235-5910).

How to Locate Information About a Specific Part

To locate the information for a specific part, the assigned reference designation for the part must be known. In addition, the Nautel nomenclature (e.g., NAPA40A) assigned to the assembly containing the part or the full reference designation, including the reference designation of all higher assemblies, must be known.

When the Nautel Nomenclature is Known:

- Refer to the appropriate family tree ([Figure 3.2.1 on page 3.2.4](#), [Figure 3.2.2 on page 3.2.5](#), or [Figure 3.2.3 on page 3.2.6](#)) and identify the block(s) associated with the Nautel nomenclature. Locate the part's reference designation in the identified reference designation list in this section, noting they are sorted alphanumerically.

When the Reference Designation is Known:

- Refer to the appropriate family tree depicted in [Figure 3.2.1 on page 3.2.4](#), [Figure 3.2.2 on page 3.2.5](#), or [Figure 3.2.3 on page 3.2.6](#) with the full reference designation.
- Follow the family tree branches to the block that represents the lowest level assembly assigned a Nautel configuration control number, then locate the reference designation information for that Nautel configuration control number.
- Locate the part's reference designation and associated Nautel Part # in the list provided at the end of this section. In a PDF manual, use Ctrl-F (find) to quickly locate the reference designation.

Reference Designation Lists

Reference designation lists are provided for assemblies that are assigned an alpha-prefixed Nautel nomenclature (e.g., NAPA40A) or a numbered Nautel part (e.g., 235-8050).

To obtain the full reference designation for a specific part the Nautel configuration control number must be located in the appropriate family tree ([Figure 3.2.1 on page 3.2.4](#), [Figure 3.2.2 on page 3.2.5](#), or [Figure 3.2.3 on page 3.2.6](#)) to include the reference designation of all higher level assemblies. The reference designation lists are presented in alphanumeric order - for each component level of the transmitter - are divided into columns to aid in locating specific information.

Column Content

The following paragraphs provide an explanation of the purpose and contents of each column in the part number indexes.

Component Level, Stock Code Column

This column contains the Component Level number (01 through 10, as required) and the Nautel Stock Code (part number) assigned to each part.

Component Level

This number represents the level of a component in relation to the highest level parts list. In this case the highest level parts list is the VX transmitter's overall parts list, or the top block in the family tree shown in [Figure 3.2.1 on page 3.2.4](#), [Figure 3.2.2 on page 3.2.5](#), or [Figure 3.2.3 on page 3.2.6](#).

Components that are directly descended from the highest level parts list are component level 01. The associated stock code and description for level 01 items appear in bold text in the reference designation list, followed by their sub-assembly components, as applicable. Level 01 items are sorted alphanumerically.

Components that are directly descended from component level 01 items are component level 02. The associated stock code and description for level 02 items appear below their associated level 01 component, slightly indented, followed by their sub-assembly components, as applicable. Level 02 items are sorted alphanumerically.

Component level 03 through 10 items, as applicable, descend similarly to component level 02 items, with continuing indentations to identify each new level.

Stock Code

This number is Nautel's drawing number for Nautel manufactured parts, Nautel's configuration control number for assemblies that are under configuration control management, or Nautel's inventory management number for purchased parts. When a Nautel configuration control number (e.g., NAPA*) is shown in this column, its sub-assembly reference designation items are listed below it.

NOTE: *This section includes Nautel part numbers only. It does not include original equipment manufacturer (OEM) information (i.e., vendor part numbers). Some vendor information is provided in the Responding to Alarms section of this manual, otherwise contact Nautel to order a replacement part or to request assistance to find a suitable replacement.*

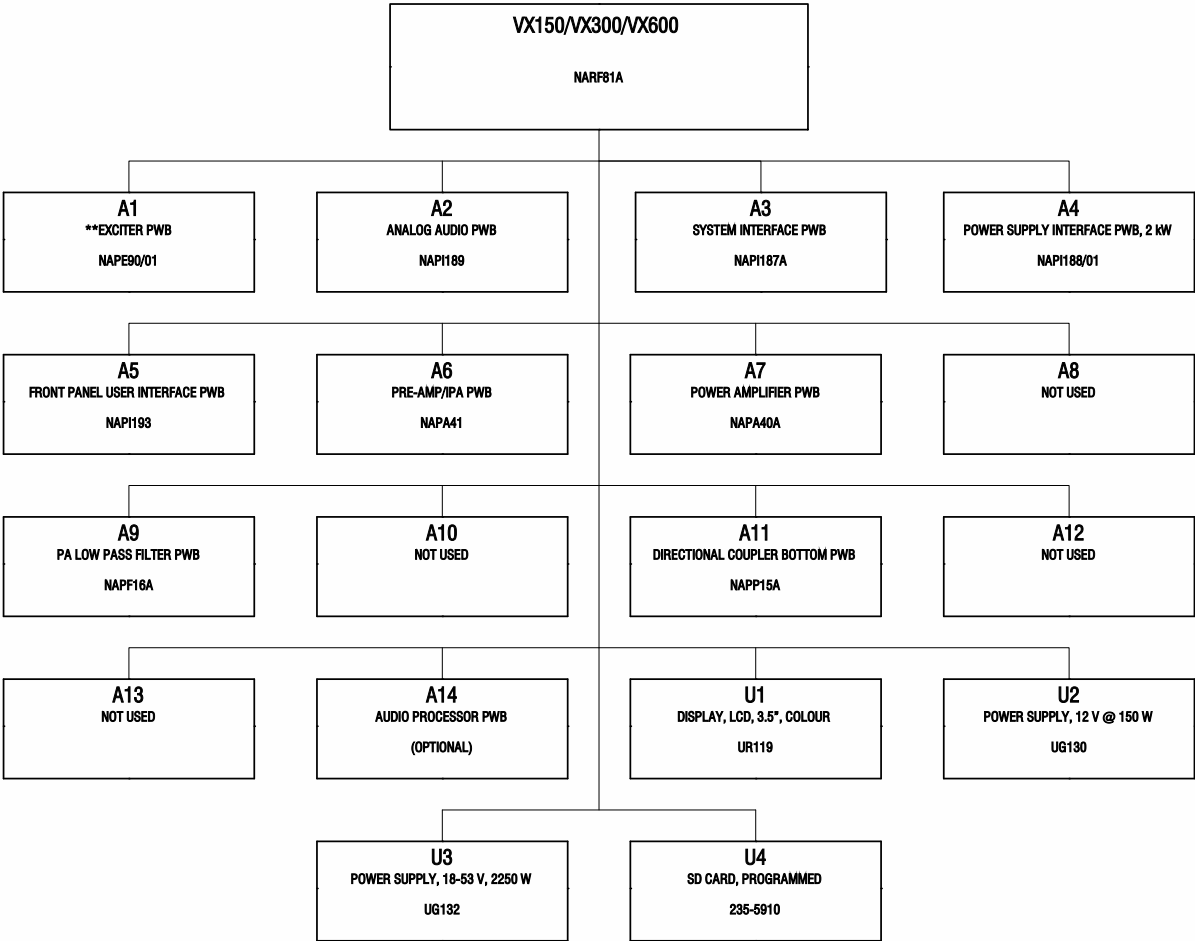
Description Column

The Description column contains the name and descriptive information for each part. The key word is presented first, followed by the adjective identifiers.

Reference Designation Column

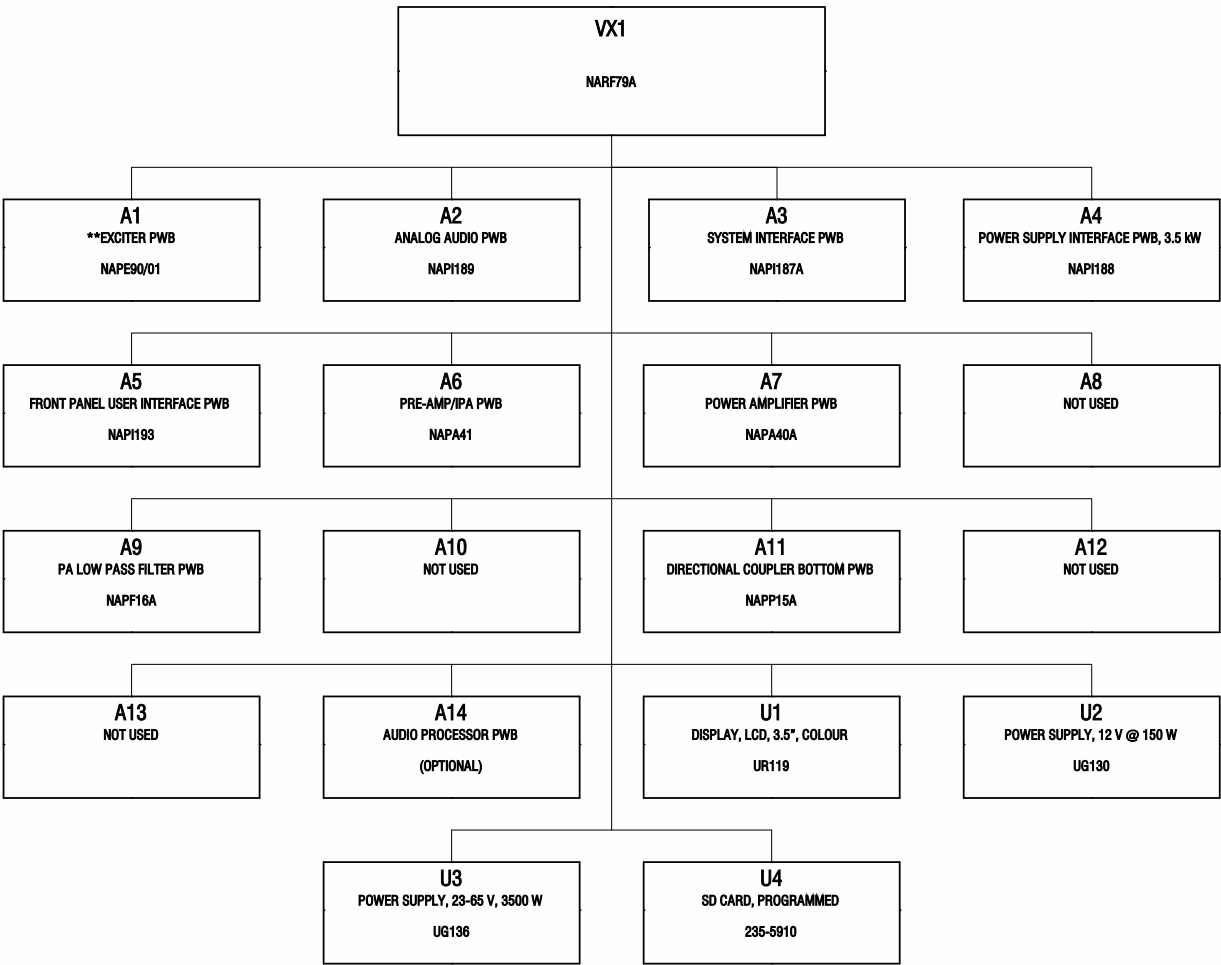
The Reference Designation column contains the reference designation(s) for a specific part. When multiple reference designations apply to a part, they are sorted alphanumerically. These designations are assigned in accordance with the requirements of American Society of Mechanical Engineers ASME Y14.44-2008.

Figure 3.2.1: VX150/VX300/VX600 Family Tree (NARF81A)



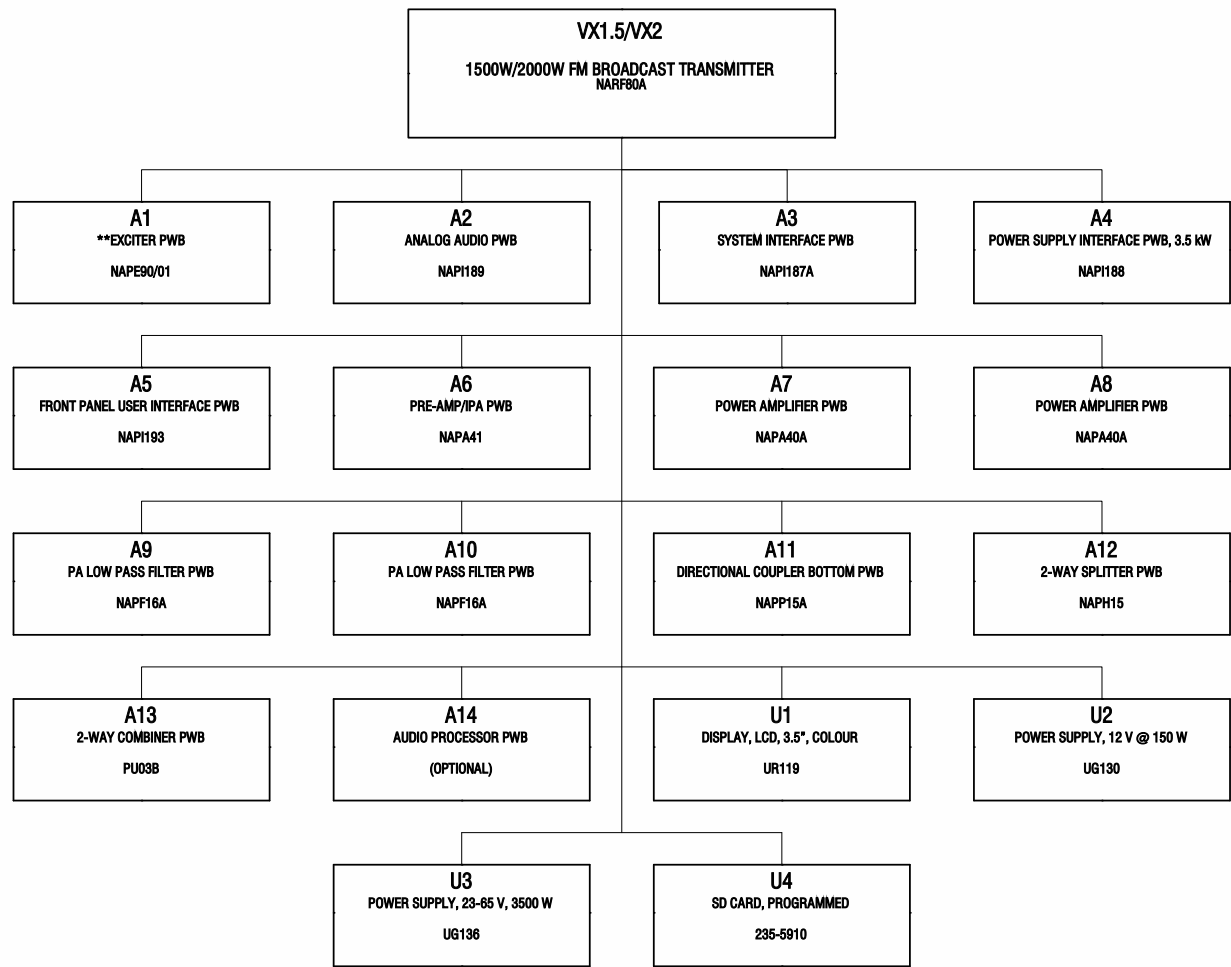
** DENOTES THE NAPE90 EXCITER IS CONSIDERED PROPRIETARY BY NAUTEL. COMPONENT DETAILS ARE NOT PROVIDED IN THIS MANUAL.
235-8300-01-FAM01 Iss. B

Figure 3.2.2: VX1 Family Tree (NARF79A)



** DENOTES THE NAPE90 EXCITER IS CONSIDERED PROPRIETARY BY NAUTEL. COMPONENT DETAILS ARE NOT PROVIDED IN THIS MANUAL.
235-8100-01-FAM01 Iss. B

Figure 3.2.3: VX1.5/VX2 Family Tree (NARF80A)



** DENOTES THE NAPE90 EXCITER IS CONSIDERED PROPRIETARY BY NAUTEL. COMPONENT DETAILS ARE NOT PROVIDED IN THIS MANUAL.
235-8200-01-FAM01 Iss. B

StockCode: NARF79A
Description: Final Assy, VX1,

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
01	200-5119	USB Mod, Programmed VX (Handbook)	
01	235-5910	SD card mod, Programmed (UB114)	U04
01	235-8010	Ancillary kit VX150-VX2	
01	235-8102	Wire Kit 1PA	
01	235-8900	2RU Front Panel Detail Assembly	
01	235-8917	Filter, Air, 1/8" Thk, 30 PPI, Custom Shape	
01	JA44	Conn, Coax, Recept, 7/16 DIN, Panel,50ohm	J01
01	LA82C	Inductor, Air Core, 16 AWG magnet, 17 Turn, 0.27"	L01
01	NAPA40A	PA PWB Assy	A07
02	CB48	Capacitor, SMT, Clad Mica, 100pF, 300V, +/-5% (T&R	C07
02	CT102	Capacitor,SMT, Porcelain, 12pF 1500V,+/-2% 1500V,+	C15, C22
02	CT104	Capacitor,SMT,Porcelain,1000pF ,300V,+/-5%	C16, C17, C18
02	CT105	Capacitor,SMT,Porcelain,470pF, 300V,+/-5%	C14, C19, C20, C21
02	CT110	Cap, SMT, Elect, Alum Polymer,56uF, +/-20%, 63V	C06, C10, C11
02	CT113	Capacitor, SMT, Porcelain, 680pF, 300V, +/-5%	C09, C23
02	CT115	Capacitor,SMT,12pF,+/-1%,250V, NP0,0805	C03
02	CT124	Capacitor,SMT,22pF,+/-1%,250V, NP0,0805	C02

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
02	CT66	Capacitor, SMT, Ceramic, 0.1uF 10%, 100V	C01, C12
02	FA79	Fuse, SMT, 40A, 72VDC, Very Fast	F1
02	HAC122	1 Pin Screw Terminal, Power Tap M3 Surface Mount	E1, E2
02	JT188	Conn, Jack, MCX, 50Ohm, Gold, Vert, SMT	J1
02	LA80C	Inductor, 1 turn, rectangular + angled, 0.032" cop	L1
02	LS33	Inductor, SMT, 17.5nH, 5%, 4A 3.15mm H x 6.86mm L	L2
02	LS59	Inductor, SMT, 22nH, 20%, 40A	L3
02	LS69	Inductor, SMT, 150nH, 2%, 1.2A, 4.2mm H x 4.95mm L	L4, L5
02	QAP73	Transistor, FET, LDMOS, 65V, Dual, Ruggedized	Q1
02	RAD01	Resistor, SMT, MF, 10 Ohms, 1% 1/4W	R1
02	RAD45	Resistor, SMT, MF, 47.5K Ohms, 1% 1/4W	R5
02	RFFS94	Resistor, SMT, 10 ohms, 1%, 1W, 2512	R4, R6

01	NAPA41	Pre-Amp/IPA Pwb Assy	A06
02	CCFS07	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	C08
02	CT112	Cap, SMT, Elect, Alum Polymer, 100uF, +/- 20%, 25V	C06
02	CT116	Capacitor,SMT,6.8pF,+/-0.25pF, 250V,NP0,0805	C12
02	CT117	Capacitor, SMT,33pF,+/-1%,250V, NP0,0805	C03
02	CT118	Capacitor,SMT,51pF,+/-1%,250V,NP0,0805 NP0,0805	C16
02	CT119	Capacitor,SMT,82pF,+/-2%,250V, NP0,0805	C17
02	CT120	Capacitor, SMT,150pF,+/-1%,250V, NP0,0805	C02, C04, C07
02	CT121	Capacitor,SMT,180pF,+/-1%,250V, NP0,0805	C05, C09, C15
02	CT122	Capacitor,SMT, 1000pF, +/-5%, 50V,NP0	C11, C13
02	CT123	Capacitor, SMT, 0.01uF, +/-10%, 50V,BX	C10, C14
02	FA76	Fuse, 125 VAC, VDC, 5A, Very fast acting	F1
02	JT188	Conn, Jack, MCX, 50Ohm, Gold, Vert, SMT	J1, J2
02	JU84	Conn, Header, Shrouded, 0.050" 16pos, Dual Row, Go	J3
02	LS68	Inductor, SMT, 56nH, 2%, 3A, 4.2mm H x 4.95mm L	L1
02	LS70	Inductor,SMT,51nH,+/-2%,1A, Ceramic,0805	L7
02	LS71	Inductor,SMT,33nH,+/-2%,0.5A, Ceramic,0805	L6
02	LS72	Inductor,SMT,68nH,+/-2%,0.5A, Ceramic,0805	L5
02	LS73	Inductor,SMT,5nH,+/-2%, 4A,Air	L4
02	LS74	Inductor,SMT,33nH,+/-2%, 4.8A,Air	L2, L3

StockCode: NARF79A
Description: Final Assy, VX1,

<u>Component Lvl. StockCode</u>		<u>Description</u>	<u>Reference Designation</u>
02	QAP74	Transistor,SMT,MOSFET,LDMOS, Single,40V,TO-270-2	Q1
02	RAD33	Resistor, SMT, MF, 4750 Ohms, 1%, 1/4W	R2
02	RAD95	Resistor,SMT,1 Ohm,1%, 1/4W,1206	R1
02	RAD96	Resistor,SMT,39.2 Ohms,1%,1/4W,1206 1/4W,1206	R4
02	RFFS58	Resistor, SMT, MF, 47.5Kohms, 1%, 1/10W, 0603	R3
01	NAPE90/01	Exciter, FM, PWB Assy	A01
02	CAP110	Capacitor, Double Layer Supercap, 330mF, 5.5V	C133
02	CCFS62	Cap, SMT, Ceramic, 10uF, 10%, 25V	C013, C106, C220, C234, C465
02	CCFS69	Cap, SMT, Ceramic, 47pF, 5%, 50V, C0G, 0805	C239, C240, C241, C242, C389, C402, C403, C409
02	CCFS80	Cap, SMT, Ceramic, 100uF,20%, 6.3V, 1210	C361, C363, C373, C375
02	CCFS88	Cap, SMT, Ceramic, 4.7uF, 10%, 25V, X5R, 0603	C392, C393, C394, C395, C396, C399, C400, C401, C405, C406, C407, C408, C410, C411, C412, C413
02	CCFS89	CAP, SMT, Ceramic, 22uF, Low ESR, 25V,+/-20%, 0603	C056, C062
02	CCFS90	CAP, SMT, Ceramic, 10uF, Low ESR, 25V,+/-20%, 0603	C044, C046, C048, C049, C076, C084
02	CCJ01	Cap,SMT,Ceramic,1000pF,10%, 50V,X7R,0402	C014, C022, C027, C031, C093, C094, C460
02	CCJ02	Cap,SMT,Ceramic,0.01uF,10%, 50V,X7R,0402	C004, C007, C016, C028, C032, C039, C041, C052, C053, C057, C058, C059, C065, C066, C069, C070,, C074, C075, C077, C078, C079, C081, C082, C083, C085, C087, C130, C136, C144, C149, C152, C156,, C159, C164, C165, C167, C169, C175, C176, C178, C179, C182, C183, C191, C192, C193, C194, C210,, C211, C245, C247, C250, C251, C253, C254, C255, C257, C258, C262, C266, C267, C268, C269, C270,, C271, C279, C280, C282, C283, C284, C285, C287, C293, C296, C297, C298, C299, C300, C302, C303,, C310, C311, C312, C314, C319, C324, C326, C333, C334, C335, C337, C340, C342, C343, C352, C356,, C357, C359, C360, C364, C370, C380, C384, C390, C417, C418, C419, C420, C421, C422, C424, C425,, C426, C427, C440, C441, C442, C443, C467

<u>Component Lvl. StockCode</u>		<u>Description</u>	<u>Reference Designation</u>
02	CCJ03	Cap,SMT,Ceramic,0.1uF,10%, 50V,X7R,0402	C001, C002, C003, C018, C019, C020, C025, C029, C033, C034, C036, C043, C045, C050, C055, C060,, C064, C071, C072, C073, C086, C088, C089, C090, C096, C098, C099, C101, C103, C110, C111, C117,, C119, C121, C122, C123, C126, C131, C132, C134, C135, C137, C140, C141, C145, C146, C147, C148,, C150, C153, C154, C155, C157, C161, C162, C166, C168, C170, C172, C174, C180, C181, C184, C185,, C186, C187, C188, C189, C190, C200, C201, C203, C215, C216, C221, C223, C224, C226, C227, C228,, C229, C233, C235, C237, C246, C249, C252, C256, C259, C260, C261, C263, C264, C265, C272, C273,, C274, C275, C276, C277, C278, C281, C288, C289, C290, C291, C292, C295, C301, C304, C305, C306,, C307, C308, C309, C313, C315, C316, C317, C318, C322, C325, C327, C328, C329, C330, C331, C332,, C336, C338, C339, C341, C344, C345, C346, C347, C350, C351, C369, C382, C385, C386, C387, C388,, C397, C398, C404, C414, C415, C428, C435, C439, C445, C446, C447, C448, C449, C450, C452, C455,, C456, C462, C464, C466, C470, C472, C474, C475, C476, C477
02	CCJ04	Cap,SMT,Ceramic,1uF,10%, 25V,X5R,0402	C005, C009, C017, C021, C023, C030, C035, C037, C040, C047, C051, C054, C061, C080, C097, C102,, C115, C120, C208, C213, C236, C238, C353, C377, C416, C436, C444, C453, C454, C457, C458, C461,, C463, C468, C469, C471, C473, C478
02	CCJ05	Cap,SMT,Ceramic,10uF,10%, 25V,X5R,0805	C063, C109, C139, C143, C163, C173, C195, C196, C197, C198, C222, C225, C286, C294, C320, C321,, C323,, C348, C355, C378, C391, C423, C429, C430, C431, C433, C451, C459
02	CCJ06	Cap,SMT,Ceramic,4.7uF,10%, 25V,X7R,0805	C349, C379, C381
02	CCJ07	Cap,SMT,Ceramic,100pF,1%, 50V,C0G,0402	C012, C024, C038, C067, C068, C091, C092, C171, C177, C438
02	CCJ08	Cap,SMT,Ceramic,2.2uF,10%, 25V,X5R,0402	C107
02	CCJ10	Cap,SMT,Ceramic,18pF,1%, 50V,C0G,0402	C127, C128
02	CCJ11	Cap,SMT,Ceramic,82pF,1%, 50V,C0G,0402	C026, C100, C202, C219
02	CCJ13	Cap,SMT,Ceramic,3300pF,10%, 50V,X7R,0402	C204, C205, C206, C207, C209, C212, C214, C218
02	CCJ16	Cap,SMT,Ceramic,47pF,1%, 50V,C0G,0402	C199, C217, C248
02	CCJ18	Cap,SMT,Ceramic,22uF,20%, 25V,X5R,0805	C006, C008, C011, C108, C114, C230, C231, C232, C243, C244
02	CCJ19	Cap,SMT,Ceramic,470pF,1%, 50V,C0G,0402	C042

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
02	CCJ21	Cap,SMT,Ceramic,0.22uF,10%, 25V,X5R,0402	C116, C125, C432, C434, C437
02	CCJ22	Cap,SMT,Ceramic,4700pF,10%, 50V,X7R,0402	C383
02	CCJ23	Cap,SMT,Ceramic,0.022uF,10%, 50V,X7R,0402	C104, C113, C354, C358, C362, C365, C366, C368, C372, C374, C376
02	CCJ24	Cap,SMT,Ceramic,0.047uF,10%, 50V,X7R,0402	C105, C112, C118, C367, C371
02	CCJ25	Cap,SMT,Ceramic,1000pF,1%,50V, C0G/NP0,0402	C015
02	CTFS03	Cap,SMT,Tantalum,10uF,10%,35V, 2917	C124
02	CTFS04	Cap,SMT,Tantalum,100uF,10%,10V,2917	C010, C138, C142, C151,
02	HAI66	Terminal, SMT, Test Point, PWB	TP10, TP22
02	JM49	Conn, Socket, 1xMag RJ45 + 2x USB-A	J03
02	JN60	Conn, Receptacle, Right Angle, SMA, PWB Mount	J08
02	JQ15	Conn, Post Shunt, 2 Pos, .10 C entreline	E01, E02
02	JQ16	Conn, Header, SIP, 12 Pin Breakaway, 10 Ctr	XE01, XE02
02	JQ56	Conn,SMT,Plug,SATA,Signal,R/A PWB	J14
02	JQ77	Conn, SMT, Header, Ribbon Cable, 14 pin	J12
02	JQ94	CONN, SMT, SD CARD, PUSH-PUSH, R/A	XU63
02	JR51	Terminal Block,2-pos,PWB Mount	J07
02	JT121	Conn, Dual, D-Sub, F/M, 9 pin, Rt. Angle, PWB	J06
02	JT188	Conn, Jack, MCX, 50Ohm, Gold, Vert, SMT	J09, J10
02	JT203	Conn, Micro USB 2.0 Type B, Right Angle, SMT	J15
02	JT204	Conn, BNC, Dual Stacked, Isolated	J04
02	JT77	Connector,Modular,Dual,RJ-45 Jack Rt Agl, PWB	J05
02	JT87	Conn,3-pin,PWB Mount, Fem, XLR	J01, J02
02	JU85	Conn, Header, Shrouded, 0.050" 30pos, Dual Row, Go	J17
02	JU91	Conn, Header, Shrouded, 0.050" 10pos, Dual Row, Go	J19
02	JU92	Conn, SMT, Header, 10-pin, 0.1", Dual Row, Gold	J18
02	JU96	Conn, Header, Shrouded, 0.050" 20pos, Dual Row, Go	J11, J13, J16
02	LA72	Bead, Ferrite, SMT, 120 Ohm at 100MHz, 1.3A, 0402	L37, L38, L40, L44, L45, L46, L48, L49
02	LA73	Bead, Ferrite, SMT, 1 kOhm at 100MHz, 350mA, 0402	L39, L42, L43
02	LA74	Bead, Ferrite, SMT, 1.5 kOhm at 100MHz, 500mA,0603	L52
02	LCFS01	Inductor, SMT, Choke, 600ohms, 2A, 0805	L04, L05, L07, L10, L12, L18, L20, L21, L22, L23, L26, L27, L30, L31, L32, L34, L35, L41, L50,, L53, L54, L55, L56, L57 L01, L03, L06, L09, L14, L15, L16, L19, L33, L36, L47, L51
02	LCFS02	Inductor, SMT, Choke, 2000 ohms, 80mA, 0805	L13
02	LCFS04	Bead, Ferrite SMT, 200 ohms @ 1MHz, 100mA, 1206	L24
02	LS60	Inductor, SMT, 22uH, 4A RMS, Shielded, Pwr	

StockCode: NARF79A
Description: Final Assy, VX1,

Page 6 of 51

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
02	LS62	Inductor, SMT, Power, 3.6uH, 8.2A, Shielded	L28
02	LS63	Inductor, SMT, Power, 2.2uH, 8Arms, Shielded	L29
02	LS64	Inductor, SMT, Power, 12uH, 2.2Arms, Shielded	L02, L17, L25
02	LS65	Inductor, SMT, 470nH, 550mArms, 5%, 0603	L08
02	LS75	Inductor, SMT, 2.2uH, 2.4A, Shielded	L11
02	QDLS01	Diode, SMT, LED, Green, (560nm), 0603	DS01
02	QDLS03	Diode, SMT, LED, Red, (660nm), 0603	DS02
02	QDRS01	Diode,SMT,Switching,250V,0.2A, SOD-323	CR01, CR07, CR18, CR19, CR20, CR21, CR22, CR23, CR24
02	QDSS01	Diode, SMT, Schottky, 30V, 0.2A, SOD-323	CR08, CR09, CR10
02	QN53	Transistor,SMT,MOSFET,N-Channel, 60v,115mA,SOT-23	Q01, Q02, Q03, Q04, Q05,
02	QR70	Suppressor, Transient Voltage, SMT 60V Clamp	CR04, CR05, CR06, CR11, CR12, CR15, CR16, CR17, CR25, CR26
02	QR82	Diode, SMT, TVS, Vw 5V, Vb 6V Vc 10.8V, SOT-143	CR02, CR03, CR13, CR14
02	QS32	Transistor, SMT, Dual N-CH MOSFET, 20V, 10A, SO-8	U68
02	RAE34	Resistor,SMT,MF,49.9R,1%,1/10W 0603	R363, R365, R370, R371
02	RAF01	Resistor SMT MF 0.0 Ohm Jumper 0402	R051, R129, R144, R147, R156, R161, R225, R230, R241, R264, R268, R320, R328, R349, R350,, R385, R409, R410 R005, R006, R012, R013
02	RAF10	Resistor SMT MF 4.75 Ohm 1% 1/16W 0402	R062, R075, R076, R087, R138, R191, R196, R197, R200, R204, R237, R238, R244, R247, R297, R303,, R321, R325, R326, R327, R390, R391, R392, R397, R416, R417
02	RAF20	Resistor SMT MF 33.2 Ohm 1% 1/16W 0402	R033, R049, R052, R094, R098, R108, R109, R133, R330, R332, R415
02	RAF26	Resistor SMT MF 100 Ohm 1% 1/16W 0402	R158, R206, R207, R217, R218
02	RAF27	Resistor SMT MF 121 Ohm 1% 1/16W 0402	R393, R394, R395, R396
02	RAF28	Resistor SMT MF 150 Ohm 1% 1/16W 0402	R026, R219
02	RAF32	Resistor SMT MF 332 Ohm 1% 1/16W 0402	R025, R034, R139, R140, R142, R143, R171, R208, R221, R373, R375, R376
02	RAF34	Resistor SMT MF 475 Ohm 1% 1/16W 0402	R152
02	RAF35	Resistor SMT MF 562 Ohm 1% 1/16W 0402	R040, R060, R092, R096, R099, R100, R104, R121, R124, R130, R134, R149, R163, R176, R227, R234,, R266, R267, R309, R311, R338, R339, R340, R341, R377, R401
02	RAF38	Resistor SMT MF 1000 Ohm 1% 1/16W 0402	R164, R186, R187, R259, R272, R275, R318, R324, R372
02	RAF40	Resistor SMT MF 1500 Ohm 1% 1/16W 0402	R068, R072, R074, R078, R079, R080, R081, R131, R136, R137, R145, R150, R159, R166, R168, R172,, R174, R177, R178, R181, R253, R322, R323, R357, R358, R361, R364, R366, R367, R369, R374
02	RAF42	Resistor SMT MF 2210 Ohm 1% 1/16W 0402	

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
02	RAF44	Resistor SMT MF 3320 Ohm 1% 1/16W 0402	R381
02	RAF45	Resistor SMT MF 3920 Ohm 1% 1/16W 0402	R041, R061, R404
02	RAF46	Resistor SMT MF 4750 Ohm 1% 1/16W 0402	R165, R175, R184, R188, R334, R359
02	RAF47	Resistor SMT MF 5620 Ohm 1% 1/16W 0402	R192, R193
02	RAF50	Resistor SMT MF 10.0K Ohm 1% 1/16W 0402	R011, R015, R018, R019, R020, R022, R023, R028, R029, R030, R036, R042, R043, R045, R046, R047,, R048, R050, R053, R054, R055, R056, R057, R063, R064, R065, R066, R067, R077, R082, R083, R084,, R089, R090, R101, R102, R105, R107, R111, R112, R113, R114, R117, R118, R119, R126, R128, R146,, R148, R153, R154, R157, R160, R162, R173, R180, R182, R183, R185, R189, R195, R198, R201, R205,, R210, R215, R216, R220, R223, R224, R226, R228, R229, R231, R233, R235, R236, R242, R243, R246,, R248, R249, R250, R251, R252, R261, R269, R271, R273, R277, R278, R279, R282, R287, R290, R302,, R308, R313, R314, R315, R335, R337, R342, R345, R346, R347, R348, R351, R352, R353, R356, R360,, R378, R388, R411, R412, R413, R414
02	RAF53	Resistor SMT MF 18.2K Ohm 1% 1/16W 0402	R071
02	RAF56	Resistor SMT MF 33.2K Ohm 1% 1/16W 0402	R070
02	RAF59	Resistor SMT MF 56.2K Ohm 1% 1/16W 0402	R073
02	RAF62	Resistor SMT MF 100K Ohm 1% 1/16W 0402	R031, R044, R132, R291, R292, R304, R305, R387
02	RAF63	Resistor SMT MF 121K Ohm 1% 1/16W 0402	R069
02	RAF74	Resistor SMT MF 1.00M Ohm 1% 1/16W 0402	R167
02	RAF82	Resistor SMT MF 49.9 Ohm 1% 1/16W 0402	R001, R002, R003, R004, R007, R008, R009, R010, R027, R032, R127, R151, R169, R170, R179, R354,, R355, R362, R035, R122, R190, R194, R254, R257, R258, R262, R274, R306, R316, R333
02	RAF85	Resistor SMT MF 13.3K Ohm 1% 1/16W 0402	R255, R256, R265, R307, R312, R317
02	RAF86	Resistor SMT MF 41.2K Ohm 1% 1/16W 0402	R329, R331
02	RAF88	Resistor SMT MF 243 Ohm 1% 1/16W 0402	R222, R232
02	RAF89	Resistor SMT MF 2000 Ohm 1% 1/16W 0402	R368
02	RAF91	Resistor SMT MF 9530 Ohm 1% 1/16W 0402	R086, R384
02	RFFS01	Resistor,SMT,MF,0.0ohms,Jumper ,0603	R211, R212, R239, R240
02	RFFS23	Resistor, SMT, MF, 56.2ohms, 1%, 1/10W, 0603	

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
02	RFFS26	Resistor, SMT, MF, 100ohms, 1%, 1/10W, 0603	R037, R038, R058, R059, R088, R091, R095, R097, R103, R106, R115, R135, R141, R199, R270, R280,, R281, R283, R284, R285, R286, R293, R294, R295, R296, R298, R299, R300, R301, R382, R402, R403, R116, R120, R123, R125
02	RFFS27	Resistor, SMT, MF, 121ohms, 1%, 1/10W, 0603	
02	RFFS42	Resistor,SMT,MF,2210ohms,1%,1/10W,0603	R016, R017, R379, R380, R398, R399, R400, R405, R406, R407, R408
02	RX64	Thermistor, PTC, SMT, 2920, 0.35-1.4 Ohm, 50V Max,	RT01
02	TZ102	Transformer, SMT, Balun, 50 Ohms, 1:1, 4.5-3000MHz	T04, T05
02	TZ70	Transformer, SMT, 1:1 0 800MHz	T01, T02, T03
02	TZ88	Transformer,SMT,50 ohms,0.03 to 125MHz	T06, T07
02	UD103	IC, SMT, RTC, Low Power, Wide Vcc, I2C, HWSO-8	U46
02	UDLS04	IC,SMT,CMOS,8-Bit Shft Reg,Par I/P, SOIC-16	U18
02	UDTS04	IC,SMT,RS-485 Transceiver,3.3V ,SO-8	U29, U49
02	UDTS05	IC, SMT, RS-232 Transceiver, 3.3V, SO-16	U25
02	ULAS02	IC,SMT,Opamp,Quad,Rail-To-Rail ,SOIC-14	U13
02	UM107	Filter SMT 110 MHz Low Pass 50 Ohm Elliptic	U02
02	UMDS01	IC,SMT,DAC,8-Bit,4-ch,SPI, SOIC-14	U14
02	UP108	IC, SMT, Quad USB Power Contro ller, SOIC-16	U48
02	US52	IC, SMT, Power Shift Register, 8 Bit, Wide Supply,	U19
02	US54	IC, SMT, Digital Step Attenuator, 31.5dB, 6Bit, 20	U10
02	US61	IC, SMT, E-pHEMT Gain Block, 21.8dB, 5V, SOT-89	U15
02	UT149	IC, SMT, Quad 422, Diff Line Receiver, 3.3V IN, Di	U50
02	UT154	Oscillator, SMT, LVCMOS,VCTCXO , 19.44MHz, 3.3V, H	Y01
02	UT156	IC, SMT, Voltage Reg, 1.2V, 150mA, SC-70-5	U16, U80
02	UT157	IC, SMT, DC-DC Conv, Buck, Adj, 2A, 4.5-28Vin, SOT	U09, U30
02	UT161	IC, SMT, DC-DC Quad Converter, High Current, LFCSP	U62
02	UT162	IC, SMT, Linear Regulator, LDO , 1.2V, 0.8A, DDPK	U04
02	UT163	IC, SMT, Linear Regulator, 5V, LDO, Low Noise, 12D	U08
02	UT165	Oscillator, SMT, 24MHz, 50ppm, 1.8-3.3V, 2520	Y04
02	UT166	IC, SMT, Voltage Regulator, LDO, 3.3V, 500mA, WSON	U06, U07
02	UT180	IC, SMT, Linear Voltage Reg, 0.8-6 Vout, 1A, ADJ,	U21
02	UT181	IC, SMT, Switching Voltage Reg, 1A, ADJ, 0.9-6 Vou	U20
02	UT188	Oscillator, SMT, CMOS, 50MHz, 50ppm, 1.8-3.3V, 252	Y05
02	UT83	IC,SMT,Ultrafast Single Supply Comparator,TSSOP	U32

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
02	UW194	IC SMT FPGA Cyclone 77K cells 1.1V 484-Pin FBGA	U31
02	UW195	IC SMT DAC Dual-Channel, 16- Bit, 1.25 GSPS	U11
02	UW203	SHARC+ Dual Core DSP with ARM, 450MHz, 529cspBGA	U47
02	UW204	IC, SMT, SPI Flash, 128Mbit, 3V, 8-SOIC	U52
02	UW208	Resistor, SMT, Network, 33 Ohm, Quad, 0804	U37, U38, U39, U40, U41, U42, U43, U44, U45, U53, U54, U55, U56, U57, U58, U69, U70, U71, U72,, U73, U74, U75, U76, U77 U78, U79
02	UW226	Attenuator, SMT, 1dB , 50 Ohm, 0.5W, DC to 8GHz	U01
02	UW64	IC,SMT,DAC,16 Bit Serial,MSOP-9	U27
02	UW76	Attenuator,SMT,12dB,50 ohm, 0.5W,DC to 8 GHz	U03
02	UW90	IC,SMT,Quad 2 TO 1 DATA Sel/ Mux 3 States Output,3	U23, U24, U26, U33, U61, U64, U65, U66, U67
02	UX188	IC SMT CLK SYNTH/JITTER CLEANER 48QFN	U22
02	UX192	IC, SMT, Phy, Ethernet, 10/100 , 3.3V, 1 Port, LQF	U35
02	UX193	IC, SMT, USB 2.0 Hub, 4-Port, HTQFP-64	U36
02	UX195	IC, SMT, Optocoupler, Quad, 3750Vrms ISO, SO16	U12, U17, U28
02	UX206	IC, SMT, Memory, 2Gb DDR3L SDRAM, 128Mx16, 96FBGA	U59, U60
02	UX208	IC, SMT, ADC, DUAL, 12BIT, 125MSPS, 64VQFN	U05
02	UX209	IC, SMT Current Limiting Power Distribution Switch	U81
02	UX64	IC,SMT,Power Supervisor,Dual I/P,33/1.5V,MSOP	U51
02	UX83	IC,SMT,2.5V Reference,0.1%,SOT -23-6	U34
02	XFPS10	Crystal,SMT,Fund,ParRes,32.768 kHz, 20ppm, 12.5pF,	Y03
02	XFPS16	Crystal, SMT, Fundamental, 24MHz, 18pF, 400	Y02
01	NAPF16A	PA LPF PWB Assy	A09
02	CT106	Capacitor,SMT,Porcelain,1.5pF, 1500V,+/-0.1pF	C06
02	CT107	Capacitor,SMT,Porcelain,1.8pF, 1500V,+/-0.1pF	C10
02	CT108	Capacitor,SMT,Porcelain,3.3pF, 1500V,+/-0.1pF	C08
02	CT109	Capacitor,SMT,Porcelain,5.6pF, 1500V,+/-0.1pF	C07, C09
02	HAC122	1 Pin Screw Terminal, Power Tap M3 Surface Mount	E01
02	LA77G	Inductor, SMT, Air Core, 2.5 turn, 10 AWG TCW, 0.5	L01
02	LA78G	Inductor, SMT, Air Core, 2.5 turn, 10 AWG TCW, 0.5	L02
02	LA79G	Inductor, SMT, Air Core, 2.5 turn, 10 AWG TCW, 0.4	L03

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
01	NAPI187A	System Interface PWB Assy	A03
02	CCJ01	Cap,SMT,Ceramic,1000pF,10%, 50V,X7R,0402	C02, C04, C11, C12, C14, C15, C53, C81, C82, C86
02	CCJ02	Cap,SMT,Ceramic,0.01uF,10%, 50V,X7R,0402	C19, C22, C47, C65, C83, C84
02	CCJ03	Cap,SMT,Ceramic,0.1uF,10%, 50V,X7R,0402	C01, C03, C05, C13, C16, C17, C18, C20, C21, C24, C25, C26, C27, C28, C29, C30,, C31, C32, C37, C38, C40, C41, C42, C43 C44, C45, C46, C48, C50, C51, C54, C55, C56, C57, C58, C59, C61, C63, C64, C66, C68, C69, C71, C72, C74, C77, C78, C79, C80
02	CCJ04	Cap,SMT,Ceramic,1uF,10%, 25V,X5R,0402	C08, C09, C23, C39, C73, C85
02	CCJ06	Cap,SMT,Ceramic,4.7uF,10%, 25V,X7R,0805	C52, C60, C62, C75
02	CCJ10	Cap,SMT,Ceramic,18pF,1%, 50V,C0G,0402	C67
02	CCJ18	Cap,SMT,Ceramic,22uF,20%, 25V,X5R,0805	C70, C76
02	CCJ20	Cap,SMT,Ceramic,15pF,1%, 50V,C0G,0402	C33, C35
02	CT112	Cap, SMT, Elect, Alum Polymer, 100uF, +/- 20%, 25V	C06, C07, C10
02	CT65	Cap, SMT, Ceramic, 6.8pF, 50V, +/-0.25pF, 1206	C49
02	HAJ66	Terminal, SMT, Test Point, PWB	TP03, TP14
02	JF47	Conn, Header,Square Post,Gold, Dual,40-pin	J12
02	JQ16	Conn, Header, SIP, 12 Pin Breakaway, 10 Ctr	J11
02	JR77	Terminal Block, 2 Pos, 300V, 13A, 28-14AWG, Spring	TB02
02	JR89	Terminal Block, 4 Pos, 300V, 26 - 20AWG, Spring C	TB01
02	JT188	Conn, Jack, MCX, 50Ohm, Gold, Vert, SMT	J05, J06, J09
02	JU131	Conn, Header, Shrouded, 4-pos, 3.00mm, Dual Row, G	J01, J02
02	JU84	Conn, Header, Shrouded, 0.050" 16pos, Dual Row, Go	J07
02	JU91	Conn, Header, Shrouded, 0.050" 10pos, Dual Row, Go	J04, J10
02	JU96	Conn, Header, Shrouded, 0.050" 20pos, Dual Row, Go	J03, J08
02	LCFS01	Inductor, SMT, Choke, 600ohms, 2A, 0805	L05, L06, L10, L11
02	LCFS02	Inductor, SMT, Choke, 2000 ohm s, 80mA, 0805	L08, L15, L16
02	LS18	Inductor,SMT,2.2uH,600ma,1210	L12
02	LS34	Inductor, SMT, 28nH, 2%, 4A 3.15mm H x 6.86mm L	L09
02	LS45	Inductor, SMT, Shielded, 33uH, 3.3A RMS	L03, L04
02	LS60	Inductor, SMT, 22uH, 4A RMS, Shielded, Pwr	L13
02	LS61	Inductor, SMT, 9.5nH, 480mArms, 5%, 0402	L17
02	QDLS02	Diode, SMT, LED, Yellow/Green, (570nm), 0603	DS01
02	QDSS01	Diode, SMT, Schottky, 30V, 0.2A, SOD-323	CR01, CR04, CR05
02	QN53	Transistor,SMT,MOSFET,N-Channel, 60v,115mA,SOT-23	Q01, Q02, Q03, Q04, Q05

StockCode: NARF79A
Description: Final Assy, VX1,

Page 11 of 51

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
02	QR82	Diode, SMT, TVS, Vw 5V, Vb 6V Vc 10.8V, SOT-143	CR02, CR03
02	RAD15	Resistor, SMT, MF, 150 Ohms, 1% 1/4W	R39, R40
02	RAD38	Resistor, SMT, MF, 12.1K Ohms, 1% 1/4W	R34
02	RAD93	Resistor, SMT, 0.01 ohms, 1%, 1/4W, 1206	R80
02	RAF24	Resistor SMT MF 68.1 Ohm 1% 1/16W 0402	R98
02	RAF27	Resistor SMT MF 121 Ohm 1% 1/16W 0402	R01, R03, R09, R12, R17, R20, R23, R26, R35, R38, R41, R53, R54, R61, R62, R63, R71, R72, R74,, R75, R76, R78, R84, R85 R86, R87, R91, R92, R93, R94
02	RAF34	Resistor SMT MF 475 Ohm 1% 1/16W 0402	R83, R88, R90, R95
02	RAF38	Resistor SMT MF 1000 Ohm 1% 1/16W 0402	R33
02	RAF42	Resistor SMT MF 2210 Ohm 1% 1/16W 0402	R02, R04, R43, R44, R46, R56, R57, R64, R68
02	RAF44	Resistor SMT MF 3320 Ohm 1% 1/16W 0402	R06, R08, R10, R11, R36, R52
02	RAF50	Resistor SMT MF 10.0K Ohm 1% 1/16W 0402	R05, R07, R13, R14, R15, R16, R29, R30, R31, R32, R37, R42, R47, R50, R51, R55, R65, R69, R79,, R81, R82, R89, R96
02	RAF54	Resistor SMT MF 22.1K Ohm 1% 1/16W 0402	R21, R22, R27, R28, R45, R48, R49, R58, R59, R60, R67, R70, R73
02	RAF56	Resistor SMT MF 33.2K Ohm 1% 1/16W 0402	R18, R24
02	RAF62	Resistor SMT MF 100K Ohm 1% 1/16W 0402	R19, R25, R66, R77
02	RAF83	Resistor SMT MF 499 Ohm 1% 1/16W 0402	R97
02	RFFS04	Resistor, SMT, MF, 1.50ohms, 1%, 1/10W, 0603	R99
02	RT50	Resistor,SMT,MF,0.0 ohms, Jumper,0805	L01, L02, L07, L14
02	UDTS04	IC,SMT,RS-485 Transceiver,3.3V ,SO-8	U07, U08
02	UDTS05	IC, SMT, RS-232 Transceiver, 3.3V, SO-16	U04
02	ULAS01	IC,SMT,Opamp,Quad,Single Supply,SOIC-14	U01
02	UT157	IC, SMT, DC-DC Conv, Buck, Adj, 2A, 4.5-28Vin, SOT	U06
02	UT158	IC, SMT, Amp, Current Sense, Precision, 50V/V, SOT	U05
02	UW207	Attenuator, SMT, 20dB, 50 ohm, 0.5W, DC to 8 GHz	U09
02	UX161	IC, SMT, Micro, 128K, 8K SRAM, 3.3V, TQFP-100	U02
02	UX191	IC, SMT, RMS RF Power detector , 3.3V, 40MHz-10GHz	U10
02	UX83	IC,SMT,2.5V Reference,0.1%,SOT -23-6	U03
02	XFPS14	Crystal,SMT,Fund,32.768kHz, 10ppm,12.5pF,50kOhm,-4	Y01
01	NAPI188	Power Supply Interface PWB Assy - 3.5kW	A04
02	CCFS09	Cap,SMT,Ceramic,0.47uF,10%,25V,X7R,0805	C02

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
02	CCFS52	Cap, SMT, Ceramic, 0.1uF, 10%, 25V X7R, 0603	C01, C03, C07, C09, C10, C11, C12, C13, C15, C16, C17, C18, C19, C20, C21, C22, C23, C24
02	CCFS73	Cap, SMT, Ceramic, 1uF, 10%, 16V, X5R, 0603	C05, C14
02	CX33	Cap,SMT,Ceramic,4.7uF,20%,10V, X5R,1206	C06
02	HAC122	1 Pin Screw Terminal, Power Tap M3 Surface Mount	E01, E02, E03, E04
02	HAI66	Terminal, SMT, Test Point, PWB	TP2
02	JA137	Conn, PwrBlade, 3ACP+4P+24S, RA PCB, CP3500 Mate	J01
02	JR78	Terminal Block, 3 Pos, 300V, 13A, 28-14AWG, Spring	TB1
02	JT202	Conn, Recept, AC, 250VAC, 20A, PWB Mount	J03
02	JU91	Conn, Header, Shrouded, 0.050" 10pos, Dual Row, Go	J02
02	LS23	Choke, SMT, Common Mode, 7000 ohm, 700mA	L01
02	RFC504	Resistor, SMT, 0.002 ohms, 1%, 5W	R22, R28
02	RFFS01	Resistor,SMT,MF,0.0ohms,Jumper ,0603	R32, R34, R36, R37
02	RFFS26	Resistor, SMT, MF, 100ohms, 1%, 1/10W, 0603	R09, R14
02	RFFS27	Resistor, SMT, MF, 121ohms, 1%, 1/10W, 0603	R04, R05, R06, R07
02	RFFS34	Resistor,SMT,MF,475ohms,1%, 1/10W,0603	R03, R10
02	RFFS38	Resistor,SMT,MF,1000ohms,1%, 1/10W,0603	R29, R30
02	RFFS40	Resistor,SMT,MF,1500ohms,1%, 1/10W,0603	R25, R26
02	RFFS42	Resistor,SMT,MF,2210ohms,1%,1/10W,0603	R08, R16, R17, R19
02	RFFS43	Resistor, SMT, MF, 2740ohms, 1%, 1/10W, 0603	R11
02	RFFS46	Resistor, SMT, MF, 4750ohms, 1%, 1/10W, 0603	R13
02	RFFS50	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	R01, R02, R12, R20, R23, R24, R27
02	RFFS59	Resistor,SMT,MF,56.2Kohms,1%, 1/10W,0603	R15, R18
02	ULAS02	IC,SMT,Opamp,Quad,Rail-To-Rail ,SOIC-14	U05
02	UP156	IC, SMT, Linear Voltage Regula tor, 3.3V, SOT-223	U01
02	US49	IC, SMT, ADC, 12 bit, 8 Ch, 3.3V, I2C	U02
02	UT74	IC, Amplifier, Instrumentation	U04, U06
02	UX83	IC,SMT,2.5V Reference,0.1%,SOT -23-6	U03
01	NAPI189	Analog Audio PWB Assy	A02
02	CCFS54	Cap,SMT,Ceramic,1500pF,10%,50V ,X7R,0603	C058, C074, C117, C118
02	CCJ01	Cap,SMT,Ceramic,1000pF,10%, 50V,X7R,0402	C001, C005, C006, C022, C023, C028, C029, C045
02	CCJ02	Cap,SMT,Ceramic,0.01uF,10%, 50V,X7R,0402	C036, C044, C061

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
02	CCJ03	Cap,SMT,Ceramic,0.1uF,10%, 50V,X7R,0402	C003, C007, C008, C010, C015, C016, C017, C018, C019, C020, C026, C031, C032, C034, C038, C039,, C051, C053, C056, C062, C065, C067, C082, C083, C085, C087, C088, C091, C095, C098, C100,, C104, C108, C111, C113, C115, C121, C124, C127, C131
02	CCJ04	Cap,SMT,Ceramic,1uF,10%, 25V,X5R,0402	C004, C009, C012, C014, C021, C024, C025, C027, C037, C041, C046, C050, C055, C063, C068, C069,, C073, C078, C081, C086, C092, C094, C101, C102, C103, C107, C112, C116, C119, C120
02	CCJ05	Cap,SMT,Ceramic,10uF,10%, 25V,X5R,0805	C033, C040, C054, C059, C070, C071, C072, C079, C090, C132
02	CCJ07	Cap,SMT,Ceramic,100pF,1%, 50V,C0G,0402	C048, C049, C057, C080, C089, C110, C128
02	CCJ08	Cap,SMT,Ceramic,2.2uF,10%, 25V,X5R,0402	C011, C035, C043, C060, C097
02	CCJ10	Cap,SMT,Ceramic,18pF,1%, 50V,C0G,0402	C093, C105, C114, C125
02	CCJ13	Cap,SMT,Ceramic,3300pF,10%, 50V,X7R,0402	C077
02	CCJ19	Cap,SMT,Ceramic,470pF,1%, 50V,C0G,0402	C042, C076, C122
02	CCJ20	Cap,SMT,Ceramic,15pF,1%, 50V,C0G,0402	C099
02	CCJ26	Cap,SMT,Ceramic,220pF,1%,50V, COG/NPO,0402	C052, C109
02	CCJ28	Cap,SMT,Ceramic,39pF,1%,50V, NPO/COG,0402	C075, C123
02	H AJ66	Terminal, SMT, Test Point, PWB	TP01, TP14
02	JT204	Conn, BNC, Dual Stacked, Isolated	J01
02	JT61	Conn, BNC, Recept, 50ohm,Insul , Rt Angle	J02
02	JT87	Conn,3-pin,PWB Mount, Fem, XLR	J03, J04
02	JU85	Conn, Header, Shrouded, 0.050" 30pos, Dual Row, Go	J05
02	LA72	Bead, Ferrite, SMT, 120 Ohm at 100MHz, 1.3A, 0402	L02
02	LS56	Inductor, SMT, 3.3uH, 5.6A,RMS	L01, L03, L04
02	QDDS02	Diode, SMT, Schottky, 40V, 1A, SMA	CR04
02	QDSS01	Diode, SMT, Schottky, 30V, 0.2A, SOD-323	CR03
02	QDZS11	Diode, SMT, Zener, 5.6V, 1.5W, SMA, 403D	CR01, CR02, CR05, CR06
02	RAD23	Resistor, SMT, MF, 681 Ohms, 1% 1/4W	R011, R052
02	RAF01	Resistor SMT MF 0.0 Ohm Jumper 0402	R034, R095, R099, R100, R123
02	RAF18	Resistor SMT MF 22.1 Ohm 1% 1/16W 0402	R090, R103, R144, R145
02	RAF26	Resistor SMT MF 100 Ohm 1% 1/16W 0402	R003, R018, R037, R038, R048, R069, R082, R097, R113, R131, R153

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
02	RAF38	Resistor SMT MF 1000 Ohm 1% 1/16W 0402	R007, R008, R009, R014, R015, R016, R031, R032, R044, R045, R046, R060, R061, R062, R109, R110,, R117, R125, R127, R128, R129, R136, R137, R149, R150
02	RAF50	Resistor SMT MF 10.0K Ohm 1% 1/16W 0402	R004, R005, R012, R019, R023, R025, R026, R027, R033, R035, R039, R041, R042, R050, R051, R053,, R056, R057, R058, R066, R070, R073, R074, R075, R080, R085, R086, R089, R093, R096, R098, R101,, R102, R104, R105, R106, R107, R108, R114, R119, R126, R134, R135, R146, R147, R148
02	RAF52	Resistor SMT MF 15.0K Ohm 1% 1/16W 0402	R021, R029, R079, R118
02	RAF56	Resistor SMT MF 33.2K Ohm 1% 1/16W 0402	R055
02	RAF57	Resistor SMT MF 39.2K Ohm 1% 1/16W 0402	R006, R013, R020, R043, R059, R072, R088, R111, R116, R141, R151
02	RAF59	Resistor SMT MF 56.2K Ohm 1% 1/16W 0402	R024, R028, R049, R054, R094
02	RAF63	Resistor SMT MF 121K Ohm 1% 1/16W 0402	R071
02	RAF66	Resistor SMT MF 221K Ohm 1% 1/16W 0402	R087, R120
02	RAF74	Resistor SMT MF 1.00M Ohm 1% 1/16W 0402	R001, R030
02	RAF87	Resistor SMT MF 3740 Ohm 1% 1/16W 0402	R010, R017, R047, R063
02	RAF93	Resistor SMT MF 7.15K Ohm 1% 1/16W 0402	R077, R083, R132, R139
02	RAF94	Resistor SMT MF 3.57K Ohm 1% 1/16W 0402	R078, R133
02	RAF95	Resistor SMT MF 4.12K Ohm 1% 1/16W 0402	R084, R091, R140, R142
02	RAF96	Resistor SMT MF 2.10K Ohm 1% 1/16W 0402	R092, R143
02	US12	IC, SMT, Rectifier, Bridge, 400V, 0.5A, SOIC-4	U02, U08, U21, U26
02	US58	IC, SMT, 24Bit Audio Codec, SPI, I2C, TSSOP28	U06
02	US59	IC, SMT, 10-Bit A/D Converter, 4Ch, 200KSPS, 10-VS	U03
02	US60	IC, SMT, ADC 16 Bit, 2Ch, 750KSPS, 16-WQFN	U17
02	UT170	IC, SMT, Adj. DC to DC Inverting Reg, 2.4A, 16-LFC	U20
02	UT171	IC, SMT, Op AMP, Dual, Low Noise, Bipol Supply, 8-	U01, U04, U09, U13, U15, U18, U19, U23
02	UT172	IC, SMT, Precision Diff Amp, 8-MSOP	U05, U10, U16, U25
02	UT178	IC, SMT, Rail to Rail Dual Op-amp, Wide BW, SOIC8	U14, U24
02	UX66	IC,SMT,Linear Regulator,150mA Adj.,MSOP-8	U07, U11, U12
02	UX83	IC,SMT,2.5V Reference,0.1%,SOT -23-6	U22
01	NAPI193	Front Panel User Interface Pwb Assy	A05
02	CCFS04	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	C02, C03

StockCode: NARF79A
Description: Final Assy, VX1,

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
02	CCFS07	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	C04
02	CCJ18	Cap,SMT,Ceramic,22uF,20%, 25V,X5R,0805	C06
02	CT112	Cap, SMT, Elect, Alum Polymer, 100uF, +/- 20%, 25V	C05
02	JA140	Conn, USB, Vertical Mount, Type A, PWB	J04
02	JQ55	Conn, Header, Ribbon Cbl, 20 Pin	J03
02	JQ97	Conn, Header, SATA, Vert, PWB	J01
02	JU96	Conn, Header, Shrouded, 0.050" 20pos, Dual Row, Go	J02
02	LS18	Inductor,SMT,2.2uH,600ma,1210	L01
02	QM77	Diode, LED, RED, Rectangular, TH, 5mm x 2mm	DS1
02	QN53	Transistor,SMT,MOSFET,N-Channel, 60v,115mA,SOT-23	Q01, Q02, Q03, Q04, Q05
02	RFFS18	Resistor, SMT, MF, 22.1ohms, 1%, 1/10W, 0603	R20, R21
02	RFFS26	Resistor, SMT, MF, 100ohms, 1%, 1/10W, 0603	R12, R16
02	RFFS28	Resistor, SMT, MF, 150ohms, 1%, 1/10W, 0603	R03, R05, R06, R14, R18
02	RFFS50	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	R02, R04, R07, R08, R09, R10, R11, R13, R15, R17, R19, R22, R23
02	SD94	Switch, Push-Button, Green/Red, MOM, SPST-NO, PWB	S01, S02
02	SD95	Switch, Push-Button, Tactile, SPST-NO, PWB	S03
02	UC107	Rotary Encoder, 20PPR, Quadrature, w / MOM Push Bu	U01
01	NAPP15A	Directional Coupler Bottom PWB Assy	A11
02	JT188	Conn, Jack, MCX, 50Ohm, Gold, Vert, SMT	J01, J02, J03
02	RT73	Resistor, Termination, 50 Ohm, +/- 5%, 60W, Tuned	R01
01	RX49	Thermistor,-30/105°C,10Kohms@ 25°C,Neg,Bvalue 3435	RT01, RT02
01	UA296	Cable Assembly, Flat IDC, 0.050" Tiger Eye, 16 con	W02
01	UA297	Cable Assembly, Flat IDC, 0.050" Tiger Eye, 20 con	W03
01	UA298	Cable Assembly, Flat IDC, 0.050" Tiger Eye, 20 con	W04

StockCode: NARF79A
Description: Final Assy, VX1,

Page 16 of 51

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
01	UA300	Cable Assembly, Flat IDC, 0.050" Tiger Eye, 10 con	W05
01	UA301	Cable Assembly, Flat IDC, 0.100" pitch, 20 cond, 2	W06
01	UA307	Cable, Coax, SRC 316, MCX(M) RA to MCX(M) Straight	W07, W08
01	UA309	Cable, Coax, SRC 316, MCX(M) RA to BNC(F) Bulkhead	W10
01	UA310	Cable, Coax, SRC 316, MCX(M) RA to MCX(M) RA, 12.0	W11
01	UA311	Cable, Coax, SRC 316, MCX(M) RA to MCX(M) RA, 16.0	W12
01	UA313	Cable, Coax, SRC 316, MCX(M) RA to MCX(M) Straight	W13
01	UA316	Cable, SATA, 0.5m, Straight F to Straight F, Shiel	W15
01	UA318	Cable Assembly, Flat IDC, 0.050" Tiger Eye,30 cond	W16
01	UG130	Power Supply, LED, 12V@150W, 90-305Vac, PFC, IP67	U02
01	UG136	Power Supply, 23-65Vdc, 3500W/1500W, 90-265Vac, Co	U03

StockCode: NARF79A
Description: Final Assy, VX1,

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
01	UR119	Display, TFT LCD, 320x240 Graphic, 3.5", Color, SP	U01
01	ZAP68	Fan, 80mm, 12Vdc, PWM Ctrl, Tach, w/Conn+HS Tube +	B01, B02
END OF ITEM			

StockCode: NARF80A
Description: Final Assy, VX1.5/2,

Page 18 of 51

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
01	200-5119	USB Mod, Programmed VX (Handbook)	
01	235-5910	SD card mod, Programmed (UB114)	U04
01	235-8010	Ancillary kit VX150-VX2	
01	235-8202	Wire Kit 2PA	
01	235-8900	2RU Front Panel Detail Assembly	
01	235-8917	Filter, Air, 1/8" Thk, 30 PPI, Custom Shape	
01	JA44	Conn, Coax, Recept, 7/16 DIN, Panel,50ohm	J01
01	LA82C	Inductor, Air Core, 16 AWG magnet, 17 Turn, 0.27"	L01, L02
01	NAPA40A	PA PWB Assy	A07, A08
02	CB48	Capacitor, SMT, Clad Mica, 100pF, 300V, +/-5% (T&R	C07
02	CT102	Capacitor,SMT, Porcelain, 12pF 1500V,+/-2% 1500V,+	C15, C22
02	CT104	Capacitor,SMT,Porcelain,1000pF ,300V,+/-5%	C16, C17, C18
02	CT105	Capacitor,SMT,Porcelain,470pF, 300V,+/-5%	C14, C19, C20, C21
02	CT110	Cap, SMT, Elect, Alum Polymer,56uF, +/-20%, 63V	C06, C10, C11
02	CT113	Capacitor, SMT, Porcelain, 680pF, 300V, +/-5%	C09, C23
02	CT115	Capacitor,SMT,12pF,+/-1%,250V, NP0,0805	C03
02	CT124	Capacitor,SMT,22pF,+/-1%,250V, NP0,0805	C02

StockCode: NARF80A
Description: Final Assy, VX1.5/2,

Page 19 of 51

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
02	CT66	Capacitor, SMT, Ceramic, 0.1uF 10%, 100V	C01, C12
02	FA79	Fuse, SMT, 40A, 72VDC, Very Fast	F1
02	HAC122	1 Pin Screw Terminal, Power Tap M3 Surface Mount	E1, E2
02	JT188	Conn, Jack, MCX, 50Ohm, Gold, Vert, SMT	J1
02	LA80C	Inductor, 1 turn, rectangular + angled, 0.032" cop	L1
02	LS33	Inductor, SMT, 17.5nH, 5%, 4A 3.15mm H x 6.86mm L	L2
02	LS59	Inductor, SMT, 22nH, 20%, 40A	L3
02	LS69	Inductor, SMT, 150nH, 2%, 1.2A, 4.2mm H x 4.95mm L	L4, L5
02	QAP73	Transistor, FET, LDMOS, 65V, Dual, Ruggedized	Q1
02	RAD01	Resistor, SMT, MF, 10 Ohms, 1% 1/4W	R1
02	RAD45	Resistor, SMT, MF, 47.5K Ohms, 1% 1/4W	R5
02	RFFS94	Resistor, SMT, 10 ohms, 1%, 1W, 2512	R4, R6

01	NAPA41	Pre-Amp/IPA Pwb Assy	A06
02	CCFS07	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	C08
02	CT112	Cap, SMT, Elect, Alum Polymer, 100uF, +/- 20%, 25V	C06
02	CT116	Capacitor,SMT,6.8pF,+/-0.25pF, 250V,NP0,0805	C12
02	CT117	Capacitor, SMT,33pF,+/-1%,250V, NP0,0805	C03
02	CT118	Capacitor,SMT,51pF,+/-1%,250V,NP0,0805 NP0,0805	C16
02	CT119	Capacitor,SMT,82pF,+/-2%,250V, NP0,0805	C17
02	CT120	Capacitor, SMT,150pF,+/-1%,250V, NP0,0805	C02, C04, C07
02	CT121	Capacitor,SMT,180pF,+/-1%,250V, NP0,0805	C05, C09, C15
02	CT122	Capacitor,SMT, 1000pF, +/-5%, 50V,NP0	C11, C13
02	CT123	Capacitor, SMT, 0.01uF, +/-10%, 50V,BX	C10, C14
02	FA76	Fuse, 125 VAC, VDC, 5A, Very fast acting	F1
02	JT188	Conn, Jack, MCX, 50Ohm, Gold, Vert, SMT	J1, J2
02	JU84	Conn, Header, Shrouded, 0.050" 16pos, Dual Row, Go	J3
02	LS68	Inductor, SMT, 56nH, 2%, 3A, 4.2mm H x 4.95mm L	L1
02	LS70	Inductor,SMT,51nH,+/-2%,1A, Ceramic,0805	L7
02	LS71	Inductor,SMT,33nH,+/-2%,0.5A, Ceramic,0805	L6
02	LS72	Inductor,SMT,68nH,+/-2%,0.5A, Ceramic,0805	L5
02	LS73	Inductor,SMT,5nH,+/-2%, 4A,Air	L4
02	LS74	Inductor,SMT,33nH,+/-2%, 4.8A,Air	L2, L3

StockCode: NARF80A
Description: Final Assy, VX1.5/2,

Page 20 of 51

<u>Component Lvl. StockCode</u>		<u>Description</u>	<u>Reference Designation</u>
02	QAP74	Transistor,SMT,MOSFET,LDMOS, Single,40V,TO-270-2	Q1
02	RAD33	Resistor, SMT, MF, 4750 Ohms, 1%, 1/4W	R2
02	RAD95	Resistor,SMT,1 Ohm,1%, 1/4W,1206	R1
02	RAD96	Resistor,SMT,39.2 Ohms,1%,1/4W,1206 1/4W,1206	R4
02	RFFS58	Resistor, SMT, MF, 47.5Kohms, 1%, 1/10W, 0603	R3
01	NAPE90/01	Exciter, FM, PWB Assy	A01
02	CAP110	Capacitor, Double Layer Supercap, 330mF, 5.5V	C133
02	CCFS62	Cap, SMT, Ceramic, 10uF, 10%, 25V	C013, C106, C220, C234, C465
02	CCFS69	Cap, SMT, Ceramic, 47pF, 5%, 50V, C0G, 0805	C239, C240, C241, C242, C389, C402, C403, C409
02	CCFS80	Cap, SMT, Ceramic, 100uF,20%, 6.3V, 1210	C361, C363, C373, C375
02	CCFS88	Cap, SMT, Ceramic, 4.7uF, 10%, 25V, X5R, 0603	C392, C393, C394, C395, C396, C399, C400, C401, C405, C406, C407, C408, C410, C411, C412, C413
02	CCFS89	CAP, SMT, Ceramic, 22uF, Low ESR, 25V,+/-20%, 0603	C056, C062
02	CCFS90	CAP, SMT, Ceramic, 10uF, Low ESR, 25V,+/-20%, 0603	C044, C046, C048, C049, C076, C084
02	CCJ01	Cap,SMT,Ceramic,1000pF,10%, 50V,X7R,0402	C014, C022, C027, C031, C093, C094, C460
02	CCJ02	Cap,SMT,Ceramic,0.01uF,10%, 50V,X7R,0402	C004, C007, C016, C028, C032, C039, C041, C052, C053, C057, C058, C059, C065, C066, C069, C070,, C074, C075, C077, C078, C079, C081, C082, C083, C085, C087, C130, C136, C144, C149, C152, C156,, C159, C164, C165, C167, C169, C175, C176, C178, C179, C182, C183, C191, C192, C193, C194, C210,, C211, C245, C247, C250, C251, C253, C254, C255, C257, C258, C262, C266, C267, C268, C269, C270,, C271, C279, C280, C282, C283, C284, C285, C287, C293, C296, C297, C298, C299, C300, C302, C303,, C310, C311, C312, C314, C319, C324, C326, C333, C334, C335, C337, C340, C342, C343, C352, C356,, C357, C359, C360, C364, C370, C380, C384, C390, C417, C418, C419, C420, C421, C422, C424, C425,, C426, C427, C440, C441, C442, C443, C467

StockCode: NARF80A
Description: Final Assy, VX1.5/2,

Page 21 of 51

<u>Component Lvl. StockCode</u>		<u>Description</u>	<u>Reference Designation</u>
02	CCJ03	Cap,SMT,Ceramic,0.1uF,10%, 50V,X7R,0402	C001, C002, C003, C018, C019, C020, C025, C029, C033, C034, C036, C043, C045, C050, C055, C060,, C064, C071, C072, C073, C086, C088, C089, C090, C096, C098, C099, C101, C103, C110, C111, C117,, C119, C121, C122, C123, C126, C131, C132, C134, C135, C137, C140, C141, C145, C146, C147, C148,, C150, C153, C154, C155, C157, C161, C162, C166, C168, C170, C172, C174, C180, C181, C184, C185,, C186, C187, C188, C189, C190, C200, C201, C203, C215, C216, C221, C223, C224, C226, C227, C228,, C229, C233, C235, C237, C246, C249, C252, C256, C259, C260, C261, C263, C264, C265, C272, C273,, C274, C275, C276, C277, C278, C281, C288, C289, C290, C291, C292, C295, C301, C304, C305, C306,, C307, C308, C309, C313, C315, C316, C317, C318, C322, C325, C327, C328, C329, C330, C331, C332,, C336, C338, C339, C341, C344, C345, C346, C347, C350, C351, C369, C382, C385, C386, C387, C388,, C397, C398, C404, C414, C415, C428, C435, C439, C445, C446, C447, C448, C449, C450, C452, C455,, C456, C462, C464, C466, C470, C472, C474, C475, C476, C477
02	CCJ04	Cap,SMT,Ceramic,1uF,10%, 25V,X5R,0402	C005, C009, C017, C021, C023, C030, C035, C037, C040, C047, C051, C054, C061, C080, C097, C102,, C115, C120, C208, C213, C236, C238, C353, C377, C416, C436, C444, C453, C454, C457, C458, C461,, C463, C468, C469, C471, C473, C478
02	CCJ05	Cap,SMT,Ceramic,10uF,10%, 25V,X5R,0805	C063, C109, C139, C143, C163, C173, C195, C196, C197, C198, C222, C225, C286, C294, C320, C321,, C323,, C348, C355, C378, C391, C423, C429, C430, C431, C433, C451, C459
02	CCJ06	Cap,SMT,Ceramic,4.7uF,10%, 25V,X7R,0805	C349, C379, C381
02	CCJ07	Cap,SMT,Ceramic,100pF,1%, 50V,C0G,0402	C012, C024, C038, C067, C068, C091, C092, C171, C177, C438
02	CCJ08	Cap,SMT,Ceramic,2.2uF,10%, 25V,X5R,0402	C107
02	CCJ10	Cap,SMT,Ceramic,18pF,1%, 50V,C0G,0402	C127, C128
02	CCJ11	Cap,SMT,Ceramic,82pF,1%, 50V,C0G,0402	C026, C100, C202, C219
02	CCJ13	Cap,SMT,Ceramic,3300pF,10%, 50V,X7R,0402	C204, C205, C206, C207, C209, C212, C214, C218
02	CCJ16	Cap,SMT,Ceramic,47pF,1%, 50V,C0G,0402	C199, C217, C248
02	CCJ18	Cap,SMT,Ceramic,22uF,20%, 25V,X5R,0805	C006, C008, C011, C108, C114, C230, C231, C232, C243, C244
02	CCJ19	Cap,SMT,Ceramic,470pF,1%, 50V,C0G,0402	C042

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
02	CCJ21	Cap,SMT,Ceramic,0.22uF,10%, 25V,X5R,0402	C116, C125, C432, C434, C437
02	CCJ22	Cap,SMT,Ceramic,4700pF,10%, 50V,X7R,0402	C383
02	CCJ23	Cap,SMT,Ceramic,0.022uF,10%, 50V,X7R,0402	C104, C113, C354, C358, C362, C365, C366, C368, C372, C374, C376
02	CCJ24	Cap,SMT,Ceramic,0.047uF,10%, 50V,X7R,0402	C105, C112, C118, C367, C371
02	CCJ25	Cap,SMT,Ceramic,1000pF,1%,50V, C0G/NP0,0402	C015
02	CTFS03	Cap,SMT,Tantalum,10uF,10%,35V, 2917	C124
02	CTFS04	Cap,SMT,Tantalum,100uF,10%,10V,2917	C010, C138, C142, C151,
02	HAI66	Terminal, SMT, Test Point, PWB	TP10, TP22
02	JM49	Conn, Socket, 1xMag RJ45 + 2x USB-A	J03
02	JN60	Conn, Receptacle, Right Angle, SMA, PWB Mount	J08
02	JQ15	Conn, Post Shunt, 2 Pos, .10 C entreline	E01, E02
02	JQ16	Conn, Header, SIP, 12 Pin Breakaway, 10 Ctr	XE01, XE02
02	JQ56	Conn,SMT,Plug,SATA,Signal,R/A PWB	J14
02	JQ77	Conn, SMT, Header, Ribbon Cabl e, 14 pin	J12
02	JQ94	CONN, SMT, SD CARD, PUSH-PUSH, R/A	XU63
02	JR51	Terminal Block,2-pos,PWB Mount	J07
02	JT121	Conn, Dual, D-Sub, F/M, 9 pin, Rt. Angle, PWB	J06
02	JT188	Conn, Jack, MCX, 50Ohm, Gold, Vert, SMT	J09, J10
02	JT203	Conn, Micro USB 2.0 Type B, Right Angle, SMT	J15
02	JT204	Conn, BNC, Dual Stacked, Isolated	J04
02	JT77	Connector,Modular,Dual,RJ-45 Jack Rt Agl, PWB	J05
02	JT87	Conn,3-pin,PWB Mount, Fem, XLR	J01, J02
02	JU85	Conn, Header, Shrouded, 0.050" 30pos, Dual Row, Go	J17
02	JU91	Conn, Header, Shrouded, 0.050" 10pos, Dual Row, Go	J19
02	JU92	Conn, SMT, Header, 10-pin, 0.1", Dual Row, Gold	J18
02	JU96	Conn, Header, Shrouded, 0.050" 20pos, Dual Row, Go	J11, J13, J16
02	LA72	Bead, Ferrite, SMT, 120 Ohm at 100MHz, 1.3A, 0402	L37, L38, L40, L44, L45, L46, L48, L49
02	LA73	Bead, Ferrite, SMT, 1 kOhm at 100MHz, 350mA, 0402	L39, L42, L43
02	LA74	Bead, Ferrite, SMT, 1.5 kOhm at 100MHz, 500mA,0603	L52
02	LCFS01	Inductor, SMT, Choke, 600ohms, 2A, 0805	L04, L05, L07, L10, L12, L18, L20, L21, L22, L23, L26, L27, L30, L31, L32, L34, L35, L41, L50,, L53, L54, L55, L56, L57 L01, L03, L06, L09, L14, L15, L16, L19, L33, L36, L47, L51
02	LCFS02	Inductor, SMT, Choke, 2000 ohm s, 80mA, 0805	L13
02	LCFS04	Bead, Ferrite SMT, 200 ohms @ 1MHz, 100mA, 1206	L24
02	LS60	Inductor, SMT, 22uH, 4A RMS, Shielded, Pwr	

StockCode: NARF80A

Page 23 of 51

Description: Final Assy, VX1.5/2,

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
02	LS62	Inductor, SMT, Power, 3.6uH, 8.2A, Shielded	L28
02	LS63	Inductor, SMT, Power, 2.2uH, 8Arms, Shielded	L29
02	LS64	Inductor, SMT, Power, 12uH, 2.2Arms, Shielded	L02, L17, L25
02	LS65	Inductor, SMT, 470nH, 550mArms, 5%, 0603	L08
02	LS75	Inductor, SMT, 2.2uH, 2.4A, Shielded	L11
02	QDLS01	Diode, SMT, LED, Green, (560nm), 0603	DS01
02	QDLS03	Diode, SMT, LED, Red, (660nm), 0603	DS02
02	QDRS01	Diode,SMT,Switching,250V,0.2A, SOD-323	CR01, CR07, CR18, CR19, CR20, CR21, CR22, CR23, CR24
02	QDSS01	Diode, SMT, Schottky, 30V, 0.2A, SOD-323	CR08, CR09, CR10
02	QN53	Transistor,SMT,MOSFET,N-Channel, 60v,115mA,SOT-23	Q01, Q02, Q03, Q04, Q05,
02	QR70	Suppressor, Transient Voltage, SMT 60V Clamp	CR04, CR05, CR06, CR11, CR12, CR15, CR16, CR17, CR25, CR26
02	QR82	Diode, SMT, TVS, Vw 5V, Vb 6V Vc 10.8V, SOT-143	CR02, CR03, CR13, CR14
02	QS32	Transistor, SMT, Dual N-CH MOSFET, 20V, 10A, SO-8	U68
02	RAE34	Resistor,SMT,MF,49.9R,1%,1/10W 0603	R363, R365, R370, R371
02	RAF01	Resistor SMT MF 0.0 Ohm Jumper 0402	R051, R129, R144, R147, R156, R161, R225, R230, R241, R264, R268, R320, R328, R349, R350,, R385, R409, R410 R005, R006, R012, R013
02	RAF10	Resistor SMT MF 4.75 Ohm 1% 1/16W 0402	R062, R075, R076, R087, R138, R191, R196, R197, R200, R204, R237, R238, R244, R247, R297, R303,, R321, R325, R326, R327, R390, R391, R392, R397, R416, R417
02	RAF20	Resistor SMT MF 33.2 Ohm 1% 1/16W 0402	R033, R049, R052, R094, R098, R108, R109, R133, R330, R332, R415
02	RAF26	Resistor SMT MF 100 Ohm 1% 1/16W 0402	R158, R206, R207, R217, R218
02	RAF27	Resistor SMT MF 121 Ohm 1% 1/16W 0402	R393, R394, R395, R396
02	RAF28	Resistor SMT MF 150 Ohm 1% 1/16W 0402	R026, R219
02	RAF32	Resistor SMT MF 332 Ohm 1% 1/16W 0402	R025, R034, R139, R140, R142, R143, R171, R208, R221, R373, R375, R376
02	RAF34	Resistor SMT MF 475 Ohm 1% 1/16W 0402	R152
02	RAF35	Resistor SMT MF 562 Ohm 1% 1/16W 0402	R040, R060, R092, R096, R099, R100, R104, R121, R124, R130, R134, R149, R163, R176, R227, R234,, R266, R267, R309, R311, R338, R339, R340, R341, R377, R401
02	RAF38	Resistor SMT MF 1000 Ohm 1% 1/16W 0402	R164, R186, R187, R259, R272, R275, R318, R324, R372
02	RAF40	Resistor SMT MF 1500 Ohm 1% 1/16W 0402	R068, R072, R074, R078, R079, R080, R081, R131, R136, R137, R145, R150, R159, R166, R168, R172,, R174, R177, R178, R181, R253, R322, R323, R357, R358, R361, R364, R366, R367, R369, R374
02	RAF42	Resistor SMT MF 2210 Ohm 1% 1/16W 0402	

StockCode: NARF80A
Description: Final Assy, VX1.5/2,

Page 24 of 51

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
02	RAF44	Resistor SMT MF 3320 Ohm 1% 1/16W 0402	R381
02	RAF45	Resistor SMT MF 3920 Ohm 1% 1/16W 0402	R041, R061, R404
02	RAF46	Resistor SMT MF 4750 Ohm 1% 1/16W 0402	R165, R175, R184, R188, R334, R359
02	RAF47	Resistor SMT MF 5620 Ohm 1% 1/16W 0402	R192, R193
02	RAF50	Resistor SMT MF 10.0K Ohm 1% 1/16W 0402	R011, R015, R018, R019, R020, R022, R023, R028, R029, R030, R036, R042, R043, R045, R046, R047,, R048, R050, R053, R054, R055, R056, R057, R063, R064, R065, R066, R067, R077, R082, R083, R084,, R089, R090, R101, R102, R105, R107, R111, R112, R113, R114, R117, R118, R119, R126, R128, R146,, R148, R153, R154, R157, R160, R162, R173, R180, R182, R183, R185, R189, R195, R198, R201, R205,, R210, R215, R216, R220, R223, R224, R226, R228, R229, R231, R233, R235, R236, R242, R243, R246,, R248, R249, R250, R251, R252, R261, R269, R271, R273, R277, R278, R279, R282, R287, R290, R302,, R308, R313, R314, R315, R335, R337, R342, R345, R346, R347, R348, R351, R352, R353, R356, R360,, R378, R388, R411, R412, R413, R414
02	RAF53	Resistor SMT MF 18.2K Ohm 1% 1/16W 0402	R071
02	RAF56	Resistor SMT MF 33.2K Ohm 1% 1/16W 0402	R070
02	RAF59	Resistor SMT MF 56.2K Ohm 1% 1/16W 0402	R073
02	RAF62	Resistor SMT MF 100K Ohm 1% 1/16W 0402	R031, R044, R132, R291, R292, R304, R305, R387
02	RAF63	Resistor SMT MF 121K Ohm 1% 1/16W 0402	R069
02	RAF74	Resistor SMT MF 1.00M Ohm 1% 1/16W 0402	R167
02	RAF82	Resistor SMT MF 49.9 Ohm 1% 1/16W 0402	R001, R002, R003, R004, R007, R008, R009, R010, R027, R032, R127, R151, R169, R170, R179, R354,, R355, R362
02	RAF85	Resistor SMT MF 13.3K Ohm 1% 1/16W 0402	R035, R122, R190, R194, R254, R257, R258, R262, R274, R306, R316, R333
02	RAF86	Resistor SMT MF 41.2K Ohm 1% 1/16W 0402	R255, R256, R265, R307, R312, R317
02	RAF88	Resistor SMT MF 243 Ohm 1% 1/16W 0402	R329, R331
02	RAF89	Resistor SMT MF 2000 Ohm 1% 1/16W 0402	R222, R232
02	RAF91	Resistor SMT MF 9530 Ohm 1% 1/16W 0402	R368
02	RFFS01	Resistor,SMT,MF,0.0ohms,Jumper ,0603	R086, R384
02	RFFS23	Resistor, SMT, MF, 56.2ohms, 1%, 1/10W, 0603	R211, R212, R239, R240

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
02	RFFS26	Resistor, SMT, MF, 100ohms, 1%, 1/10W, 0603	R037, R038, R058, R059, R088, R091, R095, R097, R103, R106, R115, R135, R141, R199, R270, R280,, R281, R283, R284, R285, R286, R293, R294, R295, R296, R298, R299, R300, R301, R382, R402, R403, R116, R120, R123, R125
02	RFFS27	Resistor, SMT, MF, 121ohms, 1%, 1/10W, 0603	
02	RFFS42	Resistor,SMT,MF,2210ohms,1%,1/10W,0603	R016, R017, R379, R380, R398, R399, R400, R405, R406, R407, R408
02	RX64	Thermistor, PTC, SMT, 2920, 0.35-1.4 Ohm, 50V Max,	RT01
02	TZ102	Transformer, SMT, Balun, 50 Ohms, 1:1, 4.5-3000MHz	T04, T05
02	TZ70	Transformer, SMT, 1:1 0 800MHz	T01, T02, T03
02	TZ88	Transformer,SMT,50 ohms,0.03 to 125MHz	T06, T07
02	UD103	IC, SMT, RTC, Low Power, Wide Vcc, I2C, HWSO-8	U46
02	UDLS04	IC,SMT,CMOS,8-Bit Shft Reg,Par I/P, SOIC-16	U18
02	UDTS04	IC,SMT,RS-485 Transceiver,3.3V ,SO-8	U29, U49
02	UDTS05	IC, SMT, RS-232 Transceiver, 3.3V, SO-16	U25
02	ULAS02	IC,SMT,Opamp,Quad,Rail-To-Rail ,SOIC-14	U13
02	UM107	Filter SMT 110 MHz Low Pass 50 Ohm Elliptic	U02
02	UMDS01	IC,SMT,DAC,8-Bit,4-ch,SPI, SOIC-14	U14
02	UP108	IC, SMT, Quad USB Power Contro ller, SOIC-16	U48
02	US52	IC, SMT, Power Shift Register, 8 Bit, Wide Supply,	U19
02	US54	IC, SMT, Digital Step Attenuator, 31.5dB, 6Bit, 20	U10
02	US61	IC, SMT, E-pHEMT Gain Block, 21.8dB, 5V, SOT-89	U15
02	UT149	IC, SMT, Quad 422, Diff Line Receiver, 3.3V IN, Di	U50
02	UT154	Oscillator, SMT, LVCMOS,VCTCXO , 19.44MHz, 3.3V, H	Y01
02	UT156	IC, SMT, Voltage Reg, 1.2V, 150mA, SC-70-5	U16, U80
02	UT157	IC, SMT, DC-DC Conv, Buck, Adj, 2A, 4.5-28Vin, SOT	U09, U30
02	UT161	IC, SMT, DC-DC Quad Converter, High Current, LFCSP	U62
02	UT162	IC, SMT, Linear Regulator, LDO , 1.2V, 0.8A, DDPK	U04
02	UT163	IC, SMT, Linear Regulator, 5V, LDO, Low Noise, 12D	U08
02	UT165	Oscillator, SMT, 24MHz, 50ppm, 1.8-3.3V, 2520	Y04
02	UT166	IC, SMT, Voltage Regulator, LDO, 3.3V, 500mA, WSON	U06, U07
02	UT180	IC, SMT, Linear Voltage Reg, 0.8-6 Vout, 1A, ADJ,	U21
02	UT181	IC, SMT, Switching Voltage Reg, 1A, ADJ, 0.9-6 Vou	U20
02	UT188	Oscillator, SMT, CMOS, 50MHz, 50ppm, 1.8-3.3V, 252	Y05
02	UT83	IC,SMT,Ultrafast Single Supply Comparator,TSSOP	U32

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
02	UW194	IC SMT FPGA Cyclone 77K cells 1.1V 484-Pin FBGA	U31
02	UW195	IC SMT DAC Dual-Channel, 16- Bit, 1.25 GSPS	U11
02	UW203	SHARC+ Dual Core DSP with ARM, 450MHz, 529cspBGA	U47
02	UW204	IC, SMT, SPI Flash, 128Mbit, 3V, 8-SOIC	U52
02	UW208	Resistor, SMT, Network, 33 Ohm, Quad, 0804	U37, U38, U39, U40, U41, U42, U43, U44, U45, U53, U54, U55, U56, U57, U58, U69, U70, U71, U72,, U73, U74, U75, U76, U77 U78, U79
02	UW226	Attenuator, SMT, 1dB , 50 Ohm, 0.5W, DC to 8GHz	U01
02	UW64	IC,SMT,DAC,16 Bit Serial,MSOP-9	U27
02	UW76	Attenuator,SMT,12dB,50 ohm, 0.5W,DC to 8 GHz	U03
02	UW90	IC,SMT,Quad 2 TO 1 DATA Sel/ Mux 3 States Output,3	U23, U24, U26, U33, U61, U64, U65, U66, U67
02	UX188	IC SMT CLK SYNTH/JITTER CLEANER 48QFN	U22
02	UX192	IC, SMT, Phy, Ethernet, 10/100 , 3.3V, 1 Port, LQF	U35
02	UX193	IC, SMT, USB 2.0 Hub, 4-Port, HTQFP-64	U36
02	UX195	IC, SMT, Optocoupler, Quad, 3750Vrms ISO, SO16	U12, U17, U28
02	UX206	IC, SMT, Memory, 2Gb DDR3L SDRAM, 128Mx16, 96FBGA	U59, U60
02	UX208	IC, SMT, ADC, DUAL, 12BIT, 125MSPS, 64VQFN	U05
02	UX209	IC, SMT Current Limiting Power Distribution Switch	U81
02	UX64	IC,SMT,Power Supervisor,Dual I/P,33/1.5V,MSOP	U51
02	UX83	IC,SMT,2.5V Reference,0.1%,SOT -23-6	U34
02	XFPS10	Crystal,SMT,Fund,ParRes,32.768 kHz, 20ppm, 12.5pF,	Y03
02	XFPS16	Crystal, SMT, Fundamental, 24MHz, 18pF, 400	Y02
01	NAPF16A	PA LPF PWB Assy	A09, A10
02	CT106	Capacitor,SMT,Porcelain,1.5pF, 1500V,+/-0.1pF	C06
02	CT107	Capacitor,SMT,Porcelain,1.8pF, 1500V,+/-0.1pF	C10
02	CT108	Capacitor,SMT,Porcelain,3.3pF, 1500V,+/-0.1pF	C08
02	CT109	Capacitor,SMT,Porcelain,5.6pF, 1500V,+/-0.1pF	C07, C09
02	HAC122	1 Pin Screw Terminal, Power Tap M3 Surface Mount	E01
02	LA77G	Inductor, SMT, Air Core, 2.5 turn, 10 AWG TCW, 0.5	L01
02	LA78G	Inductor, SMT, Air Core, 2.5 turn, 10 AWG TCW, 0.5	L02
02	LA79G	Inductor, SMT, Air Core, 2.5 turn, 10 AWG TCW, 0.4	L03

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
01	NAPH15	2-Way Splitter Pwb Assy	A12
02	CCFS04	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	C01, C02
02	CS81	Capacitor, SMT, Porcelain,24pF 500V, 2%	C05
02	CS89	Capacitor, SMT, Porcelain,27pF 500V, 2%	C07
02	CT53	Capacitor,SMT,Ceramic,0.001uF, 50V,10%	C03, C04
02	JT188	Conn, Jack, MCX, 50Ohm, Gold, Vert, SMT	J01, J02, J03
02	JU91	Conn, Header, Shrouded, 0.050" 10pos, Dual Row, Go	J04
02	LS68	Inductor, SMT, 56nH, 2%, 3A, 4.2mm H x 4.95mm L	L01
02	RAD38	Resistor, SMT, MF, 12.1K Ohms, 1% 1/4W	R01, R02
02	RFFS38	Resistor,SMT,MF,1000ohms,1%, 1/10W,0603	R03, R04
02	RT57	Resistor, SMT, AIN, 100 ohms, 2%, 30W, 3725	R05
01	NAPI187A	System Interface PWB Assy	A03
02	CCJ01	Cap,SMT,Ceramic,1000pF,10%, 50V,X7R,0402	C02, C04, C11, C12, C14, C15, C53, C81, C82, C86
02	CCJ02	Cap,SMT,Ceramic,0.01uF,10%, 50V,X7R,0402	C19, C22, C47, C65, C83, C84
02	CCJ03	Cap,SMT,Ceramic,0.1uF,10%, 50V,X7R,0402	C01, C03, C05, C13, C16, C17, C18, C20, C21, C24, C25, C26, C27, C28, C29, C30,, C31, C32, C37, C38, C40, C41, C42, C43 C44, C45, C46, C48, C50, C51, C54, C55, C56, C57, C58, C59, C61, C63, C64, C66, C68, C69, C71, C72, C74, C77, C78, C79, C80
02	CCJ04	Cap,SMT,Ceramic,1uF,10%, 25V,X5R,0402	C08, C09, C23, C39, C73, C85
02	CCJ06	Cap,SMT,Ceramic,4.7uF,10%, 25V,X7R,0805	C52, C60, C62, C75
02	CCJ10	Cap,SMT,Ceramic,18pF,1%, 50V,C0G,0402	C67
02	CCJ18	Cap,SMT,Ceramic,22uF,20%, 25V,X5R,0805	C70, C76
02	CCJ20	Cap,SMT,Ceramic,15pF,1%, 50V,C0G,0402	C33, C35
02	CT112	Cap, SMT, Elect, Alum Polymer, 100uF, +/- 20%, 25V	C06, C07, C10
02	CT65	Cap, SMT, Ceramic, 6.8pF, 50V, +/-0.25pF, 1206	C49
02	HAI66	Terminal, SMT, Test Point, PWB	TP03, TP14
02	JF47	Conn, Header,Square Post,Gold, Dual,40-pin	J12
02	JQ16	Conn, Header, SIP, 12 Pin Breakaway, 10 Ctr	J11
02	JR77	Terminal Block, 2 Pos, 300V, 13A, 28-14AWG, Spring	TB02
02	JR89	Terminal Block, 4 Pos, 300V, 26 - 20AWG, Spring C	TB01
02	JT188	Conn, Jack, MCX, 50Ohm, Gold, Vert, SMT	J05, J06, J09
02	JU131	Conn, Header, Shrouded, 4-pos, 3.00mm, Dual Row, G	J01, J02

StockCode: NARF80A
Description: Final Assy, VX1.5/2,

Page 28 of 51

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
02	JU84	Conn, Header, Shrouded, 0.050" 16pos, Dual Row, Go	J07
02	JU91	Conn, Header, Shrouded, 0.050" 10pos, Dual Row, Go	J04, J10
02	JU96	Conn, Header, Shrouded, 0.050" 20pos, Dual Row, Go	J03, J08
02	LCFS01	Inductor, SMT, Choke, 600ohms, 2A, 0805	L05, L06, L10, L11
02	LCFS02	Inductor, SMT, Choke, 2000 ohm s, 80mA, 0805	L08, L15, L16
02	LS18	Inductor,SMT.2.2uH,600ma,1210	L12
02	LS34	Inductor, SMT, 28nH, 2%, 4A 3.15mm H x 6.86mm L	L09
02	LS45	Inductor, SMT, Shielded, 33uH, 3.3A RMS	L03, L04
02	LS60	Inductor, SMT, 22uH, 4A RMS, Shielded, Pwr	L13
02	LS61	Inductor, SMT, 9.5nH, 480mArms, 5%, 0402	L17
02	QDLS02	Diode, SMT, LED, Yellow/Green, (570nm), 0603	DS01
02	QDSS01	Diode, SMT, Schottky, 30V, 0.2A, SOD-323	CR01, CR04, CR05
02	QN53	Transistor,SMT,MOSFET,N-Channel, 60v,115mA,SOT-23	Q01, Q02, Q03, Q04, Q05
02	QR82	Diode, SMT, TVS, Vw 5V, Vb 6V Vc 10.8V, SOT-143	CR02, CR03
02	RAD15	Resistor, SMT, MF, 150 Ohms, 1% 1/4W	R39, R40
02	RAD38	Resistor, SMT, MF, 12.1K Ohms, 1% 1/4W	R34
02	RAD93	Resistor, SMT, 0.01 ohms, 1%, 1/4W, 1206	R80
02	RAF24	Resistor SMT MF 68.1 Ohm 1% 1/16W 0402	R98
02	RAF27	Resistor SMT MF 121 Ohm 1% 1/16W 0402	R01, R03, R09, R12, R17, R20, R23, R26, R35, R38, R41, R53, R54, R61, R62, R63, R71, R72, R74,, R75, R76, R78, R84, R85 R86, R87, R91, R92, R93, R94
02	RAF34	Resistor SMT MF 475 Ohm 1% 1/16W 0402	R83, R88, R90, R95
02	RAF38	Resistor SMT MF 1000 Ohm 1% 1/16W 0402	R33
02	RAF42	Resistor SMT MF 2210 Ohm 1% 1/16W 0402	R02, R04, R43, R44, R46, R56, R57, R64, R68
02	RAF44	Resistor SMT MF 3320 Ohm 1% 1/16W 0402	R06, R08, R10, R11, R36, R52
02	RAF50	Resistor SMT MF 10.0K Ohm 1% 1/16W 0402	R05, R07, R13, R14, R15, R16, R29, R30, R31, R32, R37, R42, R47, R50, R51, R55, R65, R69, R79,, R81, R82, R89, R96
02	RAF54	Resistor SMT MF 22.1K Ohm 1% 1/16W 0402	R21, R22, R27, R28, R45, R48, R49, R58, R59, R60, R67, R70, R73
02	RAF56	Resistor SMT MF 33.2K Ohm 1% 1/16W 0402	R18, R24
02	RAF62	Resistor SMT MF 100K Ohm 1% 1/16W 0402	R19, R25, R66, R77
02	RAF83	Resistor SMT MF 499 Ohm 1% 1/16W 0402	R97
02	RFFS04	Resistor, SMT, MF, 1.50ohms, 1%, 1/10W, 0603	R99
02	RT50	Resistor,SMT,MF,0.0 ohms, Jumper,0805	L01, L02, L07, L14
02	UDTS04	IC,SMT,RS-485 Transceiver,3.3V ,SO-8	U07, U08

StockCode: NARF80A
Description: Final Assy, VX1.5/2,

Page 29 of 51

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
02	UDTS05	IC, SMT, RS-232 Transceiver, 3.3V, SO-16	U04
02	ULAS01	IC,SMT,Opamp,Quad,Single Supply,SOIC-14	U01
02	UT157	IC, SMT, DC-DC Conv, Buck, Adj, 2A, 4.5-28Vin, SOT	U06
02	UT158	IC, SMT, Amp, Current Sense, Precision, 50V/V, SOT	U05
02	UW207	Attenuator, SMT, 20dB, 50 ohm, 0.5W, DC to 8 GHz	U09
02	UX161	IC, SMT, Micro, 128K, 8K SRAM, 3.3V, TQFP-100	U02
02	UX191	IC, SMT, RMS RF Power detector , 3.3V, 40MHz-10GHz	U10
02	UX83	IC,SMT,2.5V Reference,0.1%,SOT -23-6	U03
02	XFPS14	Crystal,SMT,Fund,32.768kHz, 10ppm,12.5pF,50kOhm,-4	Y01
01	NAPI188	Power Supply Interface PWB Assy - 3.5kW	A04
02	CCFS09	Cap,SMT,Ceramic,0.47uF,10%,25V,X7R,0805	C02
02	CCFS52	Cap, SMT, Ceramic, 0.1uF, 10%, 25V X7R, 0603	C01, C03, C07, C09, C10, C11, C12, C13, C15, C16, C17, C18, C19, C20, C21, C22, C23, C24
02	CCFS73	Cap, SMT, Ceramic, 1uF, 10%, 16V, X5R, 0603	C05, C14
02	CX33	Cap,SMT,Ceramic,4.7uF,20%,10V, X5R,1206	C06
02	HAC122	1 Pin Screw Terminal, Power Tap M3 Surface Mount	E01, E02, E03, E04
02	HAJ66	Terminal, SMT, Test Point, PWB	TP2
02	JA137	Conn, PwrBlade, 3ACP+4P+24S, RA PCB, CP3500 Mate	J01
02	JR78	Terminal Block, 3 Pos, 300V, 13A, 28-14AWG, Spring	TB1
02	JT202	Conn, Recept, AC, 250VAC, 20A, PWB Mount	J03
02	JU91	Conn, Header, Shrouded, 0.050" 10pos, Dual Row, Go	J02
02	LS23	Choke, SMT, Common Mode, 7000 ohm, 700mA	L01
02	RFC04	Resistor, SMT, 0.002 ohms, 1%, 5W	R22, R28
02	RFFS01	Resistor,SMT,MF,0.0ohms,Jumper ,0603	R32, R34, R36, R37
02	RFFS26	Resistor, SMT, MF, 100ohms, 1%, 1/10W, 0603	R09, R14
02	RFFS27	Resistor, SMT, MF, 121ohms, 1%, 1/10W, 0603	R04, R05, R06, R07
02	RFFS34	Resistor,SMT,MF,475ohms,1%, 1/10W,0603	R03, R10
02	RFFS38	Resistor,SMT,MF,1000ohms,1%, 1/10W,0603	R29, R30
02	RFFS40	Resistor,SMT,MF,1500ohms,1%, 1/10W,0603	R25, R26
02	RFFS42	Resistor,SMT,MF,2210ohms,1%,1/10W,0603	R08, R16, R17, R19
02	RFFS43	Resistor, SMT, MF, 2740ohms, 1%, 1/10W, 0603	R11
02	RFFS46	Resistor, SMT, MF, 4750ohms, 1%, 1/10W, 0603	R13

StockCode: NARF80A
Description: Final Assy, VX1.5/2,

Page 30 of 51

<u>Component Lvl. StockCode</u>		<u>Description</u>	<u>Reference Designation</u>
02	RFFS50	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	R01, R02, R12, R20, R23, R24, R27
02	RFFS59	Resistor,SMT,MF,56.2Kohms,1%, 1/10W,0603	R15, R18
02	ULAS02	IC,SMT,Opamp,Quad,Rail-To-Rail ,SOIC-14	U05
02	UP156	IC, SMT, Linear Voltage Regula tor, 3.3V, SOT-223	U01
02	US49	IC, SMT, ADC, 12 bit, 8 Ch, 3.3V, I2C	U02
02	UT74	IC, Amplifier, Instrumentation	U04, U06
02	UX83	IC,SMT,2.5V Reference,0.1%,SOT -23-6	U03
01	NAPI189	Analog Audio PWB Assy	A02
02	CCFS54	Cap,SMT,Ceramic,1500pF,10%,50V ,X7R,0603	C058, C074, C117, C118
02	CCJ01	Cap,SMT,Ceramic,1000pF,10%, 50V,X7R,0402	C001, C005, C006, C022, C023, C028, C029, C045
02	CCJ02	Cap,SMT,Ceramic,0.01uF,10%, 50V,X7R,0402	C036, C044, C061
02	CCJ03	Cap,SMT,Ceramic,0.1uF,10%, 50V,X7R,0402	C003, C007, C008, C010, C015, C016, C017, C018, C019, C020, C026, C031, C032, C034, C038, C039,, C051, C053, C056, C062, C065, C067, C082, C083, C085, C087, C088, C091, C095, C098, C100,, C104, C108, C111, C113, C115, C121, C124, C127, C131
02	CCJ04	Cap,SMT,Ceramic,1uF,10%, 25V,X5R,0402	C004, C009, C012, C014, C021, C024, C025, C027, C037, C041, C046, C050, C055, C063, C068, C069,, C073, C078, C081, C086, C092, C094, C101, C102, C103, C107, C112, C116, C119, C120
02	CCJ05	Cap,SMT,Ceramic,10uF,10%, 25V,X5R,0805	C033, C040, C054, C059, C070, C071, C072, C079, C090, C132
02	CCJ07	Cap,SMT,Ceramic,100pF,1%, 50V,C0G,0402	C048, C049, C057, C080, C089, C110, C128
02	CCJ08	Cap,SMT,Ceramic,2.2uF,10%, 25V,X5R,0402	C011, C035, C043, C060, C097
02	CCJ10	Cap,SMT,Ceramic,18pF,1%, 50V,C0G,0402	C093, C105, C114, C125
02	CCJ13	Cap,SMT,Ceramic,3300pF,10%, 50V,X7R,0402	C077
02	CCJ19	Cap,SMT,Ceramic,470pF,1%, 50V,C0G,0402	C042, C076, C122
02	CCJ20	Cap,SMT,Ceramic,15pF,1%, 50V,C0G,0402	C099
02	CCJ26	Cap,SMT,Ceramic,220pF,1%,50V, COG/NPO,0402	C052, C109
02	CCJ28	Cap,SMT,Ceramic,39pF,1%,50V, NPO/COG,0402	C075, C123
02	HAJ66	Terminal, SMT, Test Point, PWB	TP01, TP14
02	JT204	Conn, BNC, Dual Stacked, Isolated	J01
02	JT61	Conn, BNC, Recept, 50ohm,Insul , Rt Angle	J02
02	JT87	Conn,3-pin,PWB Mount, Fem, XLR	J03, J04

StockCode: NARF80A

Page 31 of 51

Description: Final Assy, VX1.5/2,

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
02	JU85	Conn, Header, Shrouded, 0.050" 30pos, Dual Row, Go	J05
02	LA72	Bead, Ferrite, SMT, 120 Ohm at 100MHz, 1.3A, 0402	L02
02	LS56	Inductor, SMT, 3.3uH, 5.6A,RMS	L01, L03, L04
02	QDDS02	Diode, SMT, Schottky, 40V, 1A, SMA	CR04
02	QDSS01	Diode, SMT, Schottky, 30V, 0.2A, SOD-323	CR03
02	QDZS11	Diode, SMT, Zener, 5.6V, 1.5W, SMA, 403D	CR01, CR02, CR05, CR06
02	RAD23	Resistor, SMT, MF, 681 Ohms, 1% 1/4W	R011, R052
02	RAF01	Resistor SMT MF 0.0 Ohm Jumper 0402	R034, R095, R099, R100, R123
02	RAF18	Resistor SMT MF 22.1 Ohm 1% 1/16W 0402	R090, R103, R144, R145
02	RAF26	Resistor SMT MF 100 Ohm 1% 1/16W 0402	R003, R018, R037, R038, R048, R069, R082, R097, R113, R131, R153
02	RAF38	Resistor SMT MF 1000 Ohm 1% 1/16W 0402	R007, R008, R009, R014, R015, R016, R031, R032, R044, R045, R046, R060, R061, R062, R109, R110,, R117, R125, R127, R128, R129, R136, R137, R149, R150
02	RAF50	Resistor SMT MF 10.0K Ohm 1% 1/16W 0402	R004, R005, R012, R019, R023, R025, R026, R027, R033, R035, R039, R041, R042, R050, R051, R053,, R056, R057, R058, R066, R070, R073, R074, R075, R080, R085, R086, R089, R093, R096, R098, R101,, R102, R104, R105, R106, R107, R108, R114, R119, R126, R134, R135, R146, R147, R148
02	RAF52	Resistor SMT MF 15.0K Ohm 1% 1/16W 0402	R021, R029, R079, R118
02	RAF56	Resistor SMT MF 33.2K Ohm 1% 1/16W 0402	R055
02	RAF57	Resistor SMT MF 39.2K Ohm 1% 1/16W 0402	R006, R013, R020, R043, R059, R072, R088, R111, R116, R141, R151
02	RAF59	Resistor SMT MF 56.2K Ohm 1% 1/16W 0402	R024, R028, R049, R054, R094
02	RAF63	Resistor SMT MF 121K Ohm 1% 1/16W 0402	R071
02	RAF66	Resistor SMT MF 221K Ohm 1% 1/16W 0402	R087, R120
02	RAF74	Resistor SMT MF 1.00M Ohm 1% 1/16W 0402	R001, R030
02	RAF87	Resistor SMT MF 3740 Ohm 1% 1/16W 0402	R010, R017, R047, R063
02	RAF93	Resistor SMT MF 7.15K Ohm 1% 1/16W 0402	R077, R083, R132, R139
02	RAF94	Resistor SMT MF 3.57K Ohm 1% 1/16W 0402	R078, R133
02	RAF95	Resistor SMT MF 4.12K Ohm 1% 1/16W 0402	R084, R091, R140, R142
02	RAF96	Resistor SMT MF 2.10K Ohm 1% 1/16W 0402	R092, R143
02	US12	IC, SMT, Rectifier, Bridge, 400V, 0.5A, SOIC-4	U02, U08, U21, U26
02	US58	IC, SMT, 24Bit Audio Codec, SPI, I2C, TSSOP28	U06
02	US59	IC, SMT, 10-Bit A/D Converter, 4Ch, 200KSPS, 10-VS	U03

StockCode: NARF80A
Description: Final Assy, VX1.5/2,

Page 32 of 51

<u>Component Lvl. StockCode</u>		<u>Description</u>	<u>Reference Designation</u>
02	US60	IC, SMT, ADC 16 Bit, 2Ch, 750KSPS, 16-WQFN	U17
02	UT170	IC, SMT, Adj. DC to DC Inverting Reg, 2.4A, 16-LFC	U20
02	UT171	IC, SMT, Op AMP, Dual, Low Noise, Bipol Supply, 8-	U01, U04, U09, U13, U15, U18, U19, U23
02	UT172	IC, SMT, Precision Diff Amp, 8-MSOP	U05, U10, U16, U25
02	UT178	IC, SMT, Rail to Rail Dual Op-amp, Wide BW, SOIC8	U14, U24
02	UX66	IC,SMT,Linear Regulator,150mA Adj.,MSOP-8	U07, U11, U12
02	UX83	IC,SMT,2.5V Reference,0.1%,SOT -23-6	U22
01	NAPI193	Front Panel User Interface Pwb Assy	A05
02	CCFS04	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	C02, C03
02	CCFS07	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	C04
02	CCJ18	Cap,SMT,Ceramic,22uF,20%, 25V,X5R,0805	C06
02	CT112	Cap, SMT, Elect, Alum Polymer, 100uF, +/- 20%, 25V	C05
02	JA140	Conn, USB, Vertical Mount, Type A, PWB	J04
02	JQ55	Conn, Header, Ribbon Cbl, 20 Pin	J03
02	JQ97	Conn, Header, SATA, Vert, PWB	J01
02	JU96	Conn, Header, Shrouded, 0.050" 20pos, Dual Row, Go	J02
02	LS18	Inductor,SMT,2.2uH,600ma,1210	L01
02	QM77	Diode, LED, RED, Rectangular, TH, 5mm x 2mm	DS1
02	QN53	Transistor,SMT,MOSFET,N-Channel, 60v,115mA,SOT-23	Q01, Q02, Q03, Q04, Q05
02	RFFS18	Resistor, SMT, MF, 22.1ohms, 1%, 1/10W, 0603	R20, R21
02	RFFS26	Resistor, SMT, MF, 100ohms, 1%, 1/10W, 0603	R12, R16
02	RFFS28	Resistor, SMT, MF, 150ohms, 1%, 1/10W, 0603	R03, R05, R06, R14, R18
02	RFFS50	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	R02, R04, R07, R08, R09, R10, R11, R13, R15, R17, R19, R22, R23
02	SD94	Switch, Push-Button, Green/Red, MOM, SPST-NO, PWB	S01, S02
02	SD95	Switch, Push-Button, Tactile, SPST-NO, PWB	S03
02	UC107	Rotary Encoder, 20PPR, Quadrature, w / MOM Push Bu	U01
01	NAPP15A	Directional Coupler Bottom PWB Assy	A11
02	JT188	Conn, Jack, MCX, 50Ohm, Gold, Vert, SMT	J01, J02, J03
02	RT73	Resistor, Termination, 50 Ohm, +/- 5%, 60W, Tuned	R01

StockCode: NARF80A
Description: Final Assy, VX1.5/2,

Page 33 of 51

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
01	PU03B	PWB Detail, 2-Way Combiner, RF-35TC-0600-A-C1/C1,	A13
01	RT69	Resistor, (BeO), Flange Mount, Film, 50 Ohms, 5%,	A13R1, A13R2
01	RX49	Thermistor, -30/105°C, 10Kohms@ 25°C, Neg, Bvalue 3435	RT01, RT02
01	UA295	Cable Assembly, Flat IDC, 0.050" Tiger Eye, 10 con	W01
01	UA296	Cable Assembly, Flat IDC, 0.050" Tiger Eye, 16 con	W02
01	UA297	Cable Assembly, Flat IDC, 0.050" Tiger Eye, 20 con	W03
01	UA298	Cable Assembly, Flat IDC, 0.050" Tiger Eye, 20 con	W04
01	UA300	Cable Assembly, Flat IDC, 0.050" Tiger Eye, 10 con	W05
01	UA301	Cable Assembly, Flat IDC, 0.100" pitch, 20 cond, 2	W06
01	UA307	Cable, Coax, SRC 316, MCX(M) RA to MCX(M) Straight	W07, W08, W09
01	UA309	Cable, Coax, SRC 316, MCX(M) RA to BNC(F) Bulkhead	W10

StockCode: NARF80A
Description: Final Assy, VX1.5/2,

Page 34 of 51

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
01	UA310	Cable, Coax, SRC 316, MCX(M) RA to MCX(M) RA, 12.0	W11
01	UA311	Cable, Coax, SRC 316, MCX(M) RA to MCX(M) RA, 16.0	W12
01	UA313	Cable, Coax, SRC 316, MCX(M) RA to MCX(M) Straight	W13, W14
01	UA316	Cable, SATA, 0.5m, Straight F to Straight F, Shiel	W15
01	UA318	Cable Assembly, Flat IDC, 0.050" Tiger Eye,30 cond	W16
01	UG130	Power Supply, LED, 12V@150W, 90-305Vac, PFC, IP67	U02
01	UG136	Power Supply, 23-65Vdc, 3500W/1500W, 90-265Vac, Co	U03
01	UR119	Display, TFT LCD, 320x240 Graphic, 3.5", Color, SP	U01
01	ZAP68	Fan, 80mm, 12Vdc, PWM Ctrl, Tach, w/Conn+HS Tube +	B01, B02
END OF ITEM			

StockCode: NARF81A
Description: Final Assy, VX150/300/600,

Page 35 of 51

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
01	200-5119	USB Mod, Programmed VX (Handbook)	
01	235-5910	SD card mod, Programmed (UB114)	U04
01	235-8010	Ancillary kit VX150-VX2	
01	235-8102	Wire Kit 1PA	
01	235-8900	2RU Front Panel Detail Assembly	
01	235-8917	Filter, Air, 1/8" Thk, 30 PPI, Custom Shape	
01	JDP21	Conn, Coax, N, Recept, Panel, 50ohm	J01
01	LA82C	Inductor, Air Core, 16 AWG magnet, 17 Turn, 0.27"	L01
01	NAPA40A	PA PWB Assy	A07
02	CB48	Capacitor, SMT, Clad Mica, 100pF, 300V, +/-5% (T&R	C07
02	CT102	Capacitor,SMT, Porcelain, 12pF 1500V,+/-2% 1500V,+	C15, C22
02	CT104	Capacitor,SMT,Porcelain,1000pF ,300V,+/-5%	C16, C17, C18
02	CT105	Capacitor,SMT,Porcelain,470pF, 300V,+/-5%	C14, C19, C20, C21
02	CT110	Cap, SMT, Elect, Alum Polymer,56uF, +/-20%, 63V	C06, C10, C11
02	CT113	Capacitor, SMT, Porcelain, 680pF, 300V, +/-5%	C09, C23
02	CT115	Capacitor,SMT,12pF,+/-1%,250V, NP0,0805	C03
02	CT124	Capacitor,SMT,22pF,+/-1%,250V, NP0,0805	C02

StockCode: NARF81A

Page 36 of 51

Description: Final Assy, VX150/300/600,

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
02	CT66	Capacitor, SMT, Ceramic, 0.1uF 10%, 100V	C01, C12
02	FA79	Fuse, SMT, 40A, 72VDC, Very Fast	F1
02	HAC122	1 Pin Screw Terminal, Power Tap M3 Surface Mount	E1, E2
02	JT188	Conn, Jack, MCX, 50Ohm, Gold, Vert, SMT	J1
02	LA80C	Inductor, 1 turn, rectangular + angled, 0.032" cop	L1
02	LS33	Inductor, SMT, 17.5nH, 5%, 4A 3.15mm H x 6.86mm L	L2
02	LS59	Inductor, SMT, 22nH, 20%, 40A	L3
02	LS69	Inductor, SMT, 150nH, 2%, 1.2A, 4.2mm H x 4.95mm L	L4, L5
02	QAP73	Transistor, FET, LDMOS, 65V, Dual, Ruggedized	Q1
02	RAD01	Resistor, SMT, MF, 10 Ohms, 1% 1/4W	R1
02	RAD45	Resistor, SMT, MF, 47.5K Ohms, 1% 1/4W	R5
02	RFFS94	Resistor, SMT, 10 ohms, 1%, 1W, 2512	R4, R6
01	NAPA41	Pre-Amp/IPA Pwb Assy	A06
02	CCFS07	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	C08
02	CT112	Cap, SMT, Elect, Alum Polymer, 100uF, +/- 20%, 25V	C06
02	CT116	Capacitor,SMT,6.8pF,+/-0.25pF, 250V,NP0,0805	C12
02	CT117	Capacitor, SMT,33pF,+/-1%,250V, NP0,0805	C03
02	CT118	Capacitor,SMT,51pF,+/-1%,250V,NP0,0805 NP0,0805	C16
02	CT119	Capacitor,SMT,82pF,+/-2%,250V, NP0,0805	C17
02	CT120	Capacitor, SMT,150pF,+/-1%,250V, NP0,0805	C02, C04, C07
02	CT121	Capacitor,SMT,180pF,+/-1%,250V, NP0,0805	C05, C09, C15
02	CT122	Capacitor,SMT, 1000pF, +/-5%, 50V,NP0	C11, C13
02	CT123	Capacitor, SMT, 0.01uF, +/-10%, 50V,BX	C10, C14
02	FA76	Fuse, 125 VAC, VDC, 5A, Very fast acting	F1
02	JT188	Conn, Jack, MCX, 50Ohm, Gold, Vert, SMT	J1, J2
02	JU84	Conn, Header, Shrouded, 0.050" 16pos, Dual Row, Go	J3
02	LS68	Inductor, SMT, 56nH, 2%, 3A, 4.2mm H x 4.95mm L	L1
02	LS70	Inductor,SMT,51nH,+/-2%,1A, Ceramic,0805	L7
02	LS71	Inductor,SMT,33nH,+/-2%,0.5A, Ceramic,0805	L6
02	LS72	Inductor,SMT,68nH,+/-2%,0.5A, Ceramic,0805	L5
02	LS73	Inductor,SMT,5nH,+/-2%, 4A,Air	L4
02	LS74	Inductor,SMT,33nH,+/-2%, 4.8A,Air	L2, L3

StockCode: NARF81A
Description: Final Assy, VX150/300/600,

Page 37 of 51

<u>Component Lvl. StockCode</u>		<u>Description</u>	<u>Reference Designation</u>
02	QAP74	Transistor,SMT,MOSFET,LDMOS, Single,40V,TO-270-2	Q1
02	RAD33	Resistor, SMT, MF, 4750 Ohms, 1%, 1/4W	R2
02	RAD95	Resistor,SMT,1 Ohm,1%, 1/4W,1206	R1
02	RAD96	Resistor,SMT,39.2 Ohms,1%,1/4W,1206 1/4W,1206	R4
02	RFFS58	Resistor, SMT, MF, 47.5Kohms, 1%, 1/10W, 0603	R3
01	NAPE90/01	Exciter, FM, PWB Assy	A01
02	CAP110	Capacitor, Double Layer Supercap, 330mF, 5.5V	C133
02	CCFS62	Cap, SMT, Ceramic, 10uF, 10%, 25V	C013, C106, C220, C234, C465
02	CCFS69	Cap, SMT, Ceramic, 47pF, 5%, 50V, C0G, 0805	C239, C240, C241, C242, C389, C402, C403, C409
02	CCFS80	Cap, SMT, Ceramic, 100uF,20%, 6.3V, 1210	C361, C363, C373, C375
02	CCFS88	Cap, SMT, Ceramic, 4.7uF, 10%, 25V, X5R, 0603	C392, C393, C394, C395, C396, C399, C400, C401, C405, C406, C407, C408, C410, C411, C412, C413
02	CCFS89	CAP, SMT, Ceramic, 22uF, Low ESR, 25V,+/-20%, 0603	C056, C062
02	CCFS90	CAP, SMT, Ceramic, 10uF, Low ESR, 25V,+/-20%, 0603	C044, C046, C048, C049, C076, C084
02	CCJ01	Cap,SMT,Ceramic,1000pF,10%, 50V,X7R,0402	C014, C022, C027, C031, C093, C094, C460
02	CCJ02	Cap,SMT,Ceramic,0.01uF,10%, 50V,X7R,0402	C004, C007, C016, C028, C032, C039, C041, C052, C053, C057, C058, C059, C065, C066, C069, C070,, C074, C075, C077, C078, C079, C081, C082, C083, C085, C087, C130, C136, C144, C149, C152, C156,, C159, C164, C165, C167, C169, C175, C176, C178, C179, C182, C183, C191, C192, C193, C194, C210,, C211, C245, C247, C250, C251, C253, C254, C255, C257, C258, C262, C266, C267, C268, C269, C270,, C271, C279, C280, C282, C283, C284, C285, C287, C293, C296, C297, C298, C299, C300, C302, C303,, C310, C311, C312, C314, C319, C324, C326, C333, C334, C335, C337, C340, C342, C343, C352, C356,, C357, C359, C360, C364, C370, C380, C384, C390, C417, C418, C419, C420, C421, C422, C424, C425,, C426, C427, C440, C441, C442, C443, C467

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
02	CCJ03	Cap,SMT,Ceramic,0.1uF,10%, 50V,X7R,0402	C001, C002, C003, C018, C019, C020, C025, C029, C033, C034, C036, C043, C045, C050, C055, C060,, C064, C071, C072, C073, C086, C088, C089, C090, C096, C098, C099, C101, C103, C110, C111, C117,, C119, C121, C122, C123, C126, C131, C132, C134, C135, C137, C140, C141, C145, C146, C147, C148,, C150, C153, C154, C155, C157, C161, C162, C166, C168, C170, C172, C174, C180, C181, C184, C185,, C186, C187, C188, C189, C190, C200, C201, C203, C215, C216, C221, C223, C224, C226, C227, C228,, C229, C233, C235, C237, C246, C249, C252, C256, C259, C260, C261, C263, C264, C265, C272, C273,, C274, C275, C276, C277, C278, C281, C288, C289, C290, C291, C292, C295, C301, C304, C305, C306,, C307, C308, C309, C313, C315, C316, C317, C318, C322, C325, C327, C328, C329, C330, C331, C332,, C336, C338, C339, C341, C344, C345, C346, C347, C350, C351, C369, C382, C385, C386, C387, C388,, C397, C398, C404, C414, C415, C428, C435, C439, C445, C446, C447, C448, C449, C450, C452, C455,, C456, C462, C464, C466, C470, C472, C474, C475, C476, C477
02	CCJ04	Cap,SMT,Ceramic,1uF,10%, 25V,X5R,0402	C005, C009, C017, C021, C023, C030, C035, C037, C040, C047, C051, C054, C061, C080, C097, C102,, C115, C120, C208, C213, C236, C238, C353, C377, C416, C436, C444, C453, C454, C457, C458, C461,, C463, C468, C469, C471, C473, C478
02	CCJ05	Cap,SMT,Ceramic,10uF,10%, 25V,X5R,0805	C063, C109, C139, C143, C163, C173, C195, C196, C197, C198, C222, C225, C286, C294, C320, C321,, C323,, C348, C355, C378, C391, C423, C429, C430, C431, C433, C451, C459
02	CCJ06	Cap,SMT,Ceramic,4.7uF,10%, 25V,X7R,0805	C349, C379, C381
02	CCJ07	Cap,SMT,Ceramic,100pF,1%, 50V,C0G,0402	C012, C024, C038, C067, C068, C091, C092, C171, C177, C438
02	CCJ08	Cap,SMT,Ceramic,2.2uF,10%, 25V,X5R,0402	C107
02	CCJ10	Cap,SMT,Ceramic,18pF,1%, 50V,C0G,0402	C127, C128
02	CCJ11	Cap,SMT,Ceramic,82pF,1%, 50V,C0G,0402	C026, C100, C202, C219
02	CCJ13	Cap,SMT,Ceramic,3300pF,10%, 50V,X7R,0402	C204, C205, C206, C207, C209, C212, C214, C218
02	CCJ16	Cap,SMT,Ceramic,47pF,1%, 50V,C0G,0402	C199, C217, C248
02	CCJ18	Cap,SMT,Ceramic,22uF,20%, 25V,X5R,0805	C006, C008, C011, C108, C114, C230, C231, C232, C243, C244
02	CCJ19	Cap,SMT,Ceramic,470pF,1%, 50V,C0G,0402	C042

StockCode: NARF81A

Page 39 of 51

Description: Final Assy, VX150/300/600,

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
02	CCJ21	Cap,SMT,Ceramic,0.22uF,10%, 25V,X5R,0402	C116, C125, C432, C434, C437
02	CCJ22	Cap,SMT,Ceramic,4700pF,10%, 50V,X7R,0402	C383
02	CCJ23	Cap,SMT,Ceramic,0.022uF,10%, 50V,X7R,0402	C104, C113, C354, C358, C362, C365, C366, C368, C372, C374, C376
02	CCJ24	Cap,SMT,Ceramic,0.047uF,10%, 50V,X7R,0402	C105, C112, C118, C367, C371
02	CCJ25	Cap,SMT,Ceramic,1000pF,1%,50V, C0G/NP0,0402	C015
02	CTFS03	Cap,SMT,Tantalum,10uF,10%,35V, 2917	C124
02	CTFS04	Cap,SMT,Tantalum,100uF,10%,10V,2917	C010, C138, C142, C151,
02	HAJ66	Terminal, SMT, Test Point, PWB	TP10, TP22
02	JM49	Conn, Socket, 1xMag RJ45 + 2x USB-A	J03
02	JN60	Conn, Receptacle, Right Angle, SMA, PWB Mount	J08
02	JQ15	Conn, Post Shunt, 2 Pos, .10 C entreline	E01, E02
02	JQ16	Conn, Header, SIP, 12 Pin Breakaway, 10 Ctr	XE01, XE02
02	JQ56	Conn,SMT,Plug,SATA,Signal,R/A PWB	J14
02	JQ77	Conn, SMT, Header, Ribbon Cable, 14 pin	J12
02	JQ94	CONN, SMT, SD CARD, PUSH-PUSH, R/A	XU63
02	JR51	Terminal Block,2-pos,PWB Mount	J07
02	JT121	Conn, Dual, D-Sub, F/M, 9 pin, Rt. Angle, PWB	J06
02	JT188	Conn, Jack, MCX, 50Ohm, Gold, Vert, SMT	J09, J10
02	JT203	Conn, Micro USB 2.0 Type B, Right Angle, SMT	J15
02	JT204	Conn, BNC, Dual Stacked, Isolated	J04
02	JT77	Connector,Modular,Dual,RJ-45 Jack Rt Agl, PWB	J05
02	JT87	Conn,3-pin,PWB Mount, Fem, XLR	J01, J02
02	JU85	Conn, Header, Shrouded, 0.050" 30pos, Dual Row, Go	J17
02	JU91	Conn, Header, Shrouded, 0.050" 10pos, Dual Row, Go	J19
02	JU92	Conn, SMT, Header, 10-pin, 0.1", Dual Row, Gold	J18
02	JU96	Conn, Header, Shrouded, 0.050" 20pos, Dual Row, Go	J11, J13, J16
02	LA72	Bead, Ferrite, SMT, 120 Ohm at 100MHz, 1.3A, 0402	L37, L38, L40, L44, L45, L46, L48, L49
02	LA73	Bead, Ferrite, SMT, 1 kOhm at 100MHz, 350mA, 0402	L39, L42, L43
02	LA74	Bead, Ferrite, SMT, 1.5 kOhm at 100MHz, 500mA,0603	L52
02	LCFS01	Inductor, SMT, Choke, 600ohms, 2A, 0805	L04, L05, L07, L10, L12, L18, L20, L21, L22, L23, L26, L27, L30, L31, L32, L34, L35, L41, L50,, L53, L54, L55, L56, L57
02	LCFS02	Inductor, SMT, Choke, 2000 ohms, 80mA, 0805	L01, L03, L06, L09, L14, L15, L16, L19, L33, L36, L47, L51
02	LCFS04	Bead, Ferrite SMT, 200 ohms @ 1MHz, 100mA, 1206	L13
02	LS60	Inductor, SMT, 22uH, 4A RMS, Shielded, Pwr	L24

StockCode: NARF81A

Page 40 of 51

Description: Final Assy, VX150/300/600,

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
02	LS62	Inductor, SMT, Power, 3.6uH, 8.2A, Shielded	L28
02	LS63	Inductor, SMT, Power, 2.2uH, 8Arms, Shielded	L29
02	LS64	Inductor, SMT, Power, 12uH, 2.2Arms, Shielded	L02, L17, L25
02	LS65	Inductor, SMT, 470nH, 550mArms, 5%, 0603	L08
02	LS75	Inductor, SMT, 2.2uH, 2.4A, Shielded	L11
02	QDLS01	Diode, SMT, LED, Green, (560nm), 0603	DS01
02	QDLS03	Diode, SMT, LED, Red, (660nm), 0603	DS02
02	QDRS01	Diode,SMT,Switching,250V,0.2A, SOD-323	CR01, CR07, CR18, CR19, CR20, CR21, CR22, CR23, CR24
02	QDSS01	Diode, SMT, Schottky, 30V, 0.2A, SOD-323	CR08, CR09, CR10
02	QN53	Transistor,SMT,MOSFET,N-Channel, 60v,115mA,SOT-23	Q01, Q02, Q03, Q04, Q05,
02	QR70	Suppressor, Transient Voltage, SMT 60V Clamp	CR04, CR05, CR06, CR11, CR12, CR15, CR16, CR17, CR25, CR26
02	QR82	Diode, SMT, TVS, Vw 5V, Vb 6V Vc 10.8V, SOT-143	CR02, CR03, CR13, CR14
02	QS32	Transistor, SMT, Dual N-CH MOSFET, 20V, 10A, SO-8	U68
02	RAE34	Resistor,SMT,MF,49.9R,1%,1/10W 0603	R363, R365, R370, R371
02	RAF01	Resistor SMT MF 0.0 Ohm Jumper 0402	R051, R129, R144, R147, R156, R161, R225, R230, R241, R264, R268, R320, R328, R349, R350,, R385, R409, R410 R005, R006, R012, R013
02	RAF10	Resistor SMT MF 4.75 Ohm 1% 1/16W 0402	R062, R075, R076, R087, R138, R191, R196, R197, R200, R204, R237, R238, R244, R247, R297, R303,, R321, R325, R326, R327, R390, R391, R392, R397, R416, R417
02	RAF20	Resistor SMT MF 33.2 Ohm 1% 1/16W 0402	R033, R049, R052, R094, R098, R108, R109, R133, R330, R332, R415
02	RAF26	Resistor SMT MF 100 Ohm 1% 1/16W 0402	R158, R206, R207, R217, R218
02	RAF27	Resistor SMT MF 121 Ohm 1% 1/16W 0402	R393, R394, R395, R396
02	RAF28	Resistor SMT MF 150 Ohm 1% 1/16W 0402	R026, R219
02	RAF32	Resistor SMT MF 332 Ohm 1% 1/16W 0402	R025, R034, R139, R140, R142, R143, R171, R208, R221, R373, R375, R376
02	RAF34	Resistor SMT MF 475 Ohm 1% 1/16W 0402	R152
02	RAF35	Resistor SMT MF 562 Ohm 1% 1/16W 0402	R040, R060, R092, R096, R099, R100, R104, R121, R124, R130, R134, R149, R163, R176, R227, R234,, R266, R267, R309, R311, R338, R339, R340, R341, R377, R401
02	RAF38	Resistor SMT MF 1000 Ohm 1% 1/16W 0402	R164, R186, R187, R259, R272, R275, R318, R324, R372
02	RAF40	Resistor SMT MF 1500 Ohm 1% 1/16W 0402	R068, R072, R074, R078, R079, R080, R081, R131, R136, R137, R145, R150, R159, R166, R168, R172,, R174, R177, R178, R181, R253, R322, R323, R357, R358, R361, R364, R366, R367, R369, R374
02	RAF42	Resistor SMT MF 2210 Ohm 1% 1/16W 0402	

StockCode: NARF81A
Description: Final Assy, VX150/300/600,

Page 41 of 51

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
02	RAF44	Resistor SMT MF 3320 Ohm 1% 1/16W 0402	R381
02	RAF45	Resistor SMT MF 3920 Ohm 1% 1/16W 0402	R041, R061, R404
02	RAF46	Resistor SMT MF 4750 Ohm 1% 1/16W 0402	R165, R175, R184, R188, R334, R359
02	RAF47	Resistor SMT MF 5620 Ohm 1% 1/16W 0402	R192, R193
02	RAF50	Resistor SMT MF 10.0K Ohm 1% 1/16W 0402	R011, R015, R018, R019, R020, R022, R023, R028, R029, R030, R036, R042, R043, R045, R046, R047,, R048, R050, R053, R054, R055, R056, R057, R063, R064, R065, R066, R067, R077, R082, R083, R084,, R089, R090, R101, R102, R105, R107, R111, R112, R113, R114, R117, R118, R119, R126, R128, R146,, R148, R153, R154, R157, R160, R162, R173, R180, R182, R183, R185, R189, R195, R198, R201, R205,, R210, R215, R216, R220, R223, R224, R226, R228, R229, R231, R233, R235, R236, R242, R243, R246,, R248, R249, R250, R251, R252, R261, R269, R271, R273, R277, R278, R279, R282, R287, R290, R302,, R308, R313, R314, R315, R335, R337, R342, R345, R346, R347, R348, R351, R352, R353, R356, R360,, R378, R388, R411, R412, R413, R414
02	RAF53	Resistor SMT MF 18.2K Ohm 1% 1/16W 0402	R071
02	RAF56	Resistor SMT MF 33.2K Ohm 1% 1/16W 0402	R070
02	RAF59	Resistor SMT MF 56.2K Ohm 1% 1/16W 0402	R073
02	RAF62	Resistor SMT MF 100K Ohm 1% 1/16W 0402	R031, R044, R132, R291, R292, R304, R305, R387
02	RAF63	Resistor SMT MF 121K Ohm 1% 1/16W 0402	R069
02	RAF74	Resistor SMT MF 1.00M Ohm 1% 1/16W 0402	R167
02	RAF82	Resistor SMT MF 49.9 Ohm 1% 1/16W 0402	R001, R002, R003, R004, R007, R008, R009, R010, R027, R032, R127, R151, R169, R170, R179, R354,, R355, R362
02	RAF85	Resistor SMT MF 13.3K Ohm 1% 1/16W 0402	R035, R122, R190, R194, R254, R257, R258, R262, R274, R306, R316, R333
02	RAF86	Resistor SMT MF 41.2K Ohm 1% 1/16W 0402	R255, R256, R265, R307, R312, R317
02	RAF88	Resistor SMT MF 243 Ohm 1% 1/16W 0402	R329, R331
02	RAF89	Resistor SMT MF 2000 Ohm 1% 1/16W 0402	R222, R232
02	RAF91	Resistor SMT MF 9530 Ohm 1% 1/16W 0402	R368
02	RFFS01	Resistor,SMT,MF,0.0ohms,Jumper ,0603	R086, R384
02	RFFS23	Resistor, SMT, MF, 56.2ohms, 1%, 1/10W, 0603	R211, R212, R239, R240

StockCode: NARF81A

Page 42 of 51

Description: Final Assy, VX150/300/600,

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
02	RFFS26	Resistor, SMT, MF, 100ohms, 1%, 1/10W, 0603	R037, R038, R058, R059, R088, R091, R095, R097, R103, R106, R115, R135, R141, R199, R270, R280,, R281, R283, R284, R285, R286, R293, R294, R295, R296, R298, R299, R300, R301, R382, R402, R403, R116, R120, R123, R125
02	RFFS27	Resistor, SMT, MF, 121ohms, 1%, 1/10W, 0603	
02	RFFS42	Resistor,SMT,MF,2210ohms,1%,1/10W,0603	R016, R017, R379, R380, R398, R399, R400, R405, R406, R407, R408
02	RX64	Thermistor, PTC, SMT, 2920, 0.35-1.4 Ohm, 50V Max,	RT01
02	TZ102	Transformer, SMT, Balun, 50 Ohms, 1:1, 4.5-3000MHz	T04, T05
02	TZ70	Transformer, SMT, 1:1 0 800MHz	T01, T02, T03
02	TZ88	Transformer,SMT,50 ohms,0.03 to 125MHz	T06, T07
02	UD103	IC, SMT, RTC, Low Power, Wide Vcc, I2C, HWSO-8	U46
02	UDLS04	IC,SMT,CMOS,8-Bit Shft Reg,Par I/P, SOIC-16	U18
02	UDTS04	IC,SMT,RS-485 Transceiver,3.3V ,SO-8	U29, U49
02	UDTS05	IC, SMT, RS-232 Transceiver, 3.3V, SO-16	U25
02	ULAS02	IC,SMT,Opamp,Quad,Rail-To-Rail ,SOIC-14	U13
02	UM107	Filter SMT 110 MHz Low Pass 50 Ohm Elliptic	U02
02	UMDS01	IC,SMT,DAC,8-Bit,4-ch,SPI, SOIC-14	U14
02	UP108	IC, SMT, Quad USB Power Contro ller, SOIC-16	U48
02	US52	IC, SMT, Power Shift Register, 8 Bit, Wide Supply,	U19
02	US54	IC, SMT, Digital Step Attenuator, 31.5dB, 6Bit, 20	U10
02	US61	IC, SMT, E-pHEMT Gain Block, 21.8dB, 5V, SOT-89	U15
02	UT149	IC, SMT, Quad 422, Diff Line Receiver, 3.3V IN, Di	U50
02	UT154	Oscillator, SMT, LVCMOS,VCTCXO , 19.44MHz, 3.3V, H	Y01
02	UT156	IC, SMT, Voltage Reg, 1.2V, 150mA, SC-70-5	U16, U80
02	UT157	IC, SMT, DC-DC Conv, Buck, Adj, 2A, 4.5-28Vin, SOT	U09, U30
02	UT161	IC, SMT, DC-DC Quad Converter, High Current, LFCSP	U62
02	UT162	IC, SMT, Linear Regulator, LDO , 1.2V, 0.8A, DDPK	U04
02	UT163	IC, SMT, Linear Regulator, 5V, LDO, Low Noise, 12D	U08
02	UT165	Oscillator, SMT, 24MHz, 50ppm, 1.8-3.3V, 2520	Y04
02	UT166	IC, SMT, Voltage Regulator, LDO, 3.3V, 500mA, WSON	U06, U07
02	UT180	IC, SMT, Linear Voltage Reg, 0.8-6 Vout, 1A, ADJ,	U21
02	UT181	IC, SMT, Switching Voltage Reg, 1A, ADJ, 0.9-6 Vou	U20
02	UT188	Oscillator, SMT, CMOS, 50MHz, 50ppm, 1.8-3.3V, 252	Y05
02	UT83	IC,SMT,Ultrafast Single Supply Comparator,TSSOP	U32

StockCode: NARF81A
Description: Final Assy, VX150/300/600,

Page 43 of 51

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
02	UW194	IC SMT FPGA Cyclone 77K cells 1.1V 484-Pin FBGA	U31
02	UW195	IC SMT DAC Dual-Channel, 16- Bit, 1.25 GSPS	U11
02	UW203	SHARC+ Dual Core DSP with ARM, 450MHz, 529cspBGA	U47
02	UW204	IC, SMT, SPI Flash, 128Mbit, 3V, 8-SOIC	U52
02	UW208	Resistor, SMT, Network, 33 Ohm, Quad, 0804	U37, U38, U39, U40, U41, U42, U43, U44, U45, U53, U54, U55, U56, U57, U58, U69, U70, U71, U72,, U73, U74, U75, U76, U77 U78, U79
02	UW226	Attenuator, SMT, 1dB , 50 Ohm, 0.5W, DC to 8GHz	U01
02	UW64	IC,SMT,DAC,16 Bit Serial,MSOP-9	U27
02	UW76	Attenuator,SMT,12dB,50 ohm, 0.5W,DC to 8 GHz	U03
02	UW90	IC,SMT,Quad 2 TO 1 DATA Sel/ Mux 3 States Output,3	U23, U24, U26, U33, U61, U64, U65, U66, U67
02	UX188	IC SMT CLK SYNTH/JITTER CLEANER 48QFN	U22
02	UX192	IC, SMT, Phy, Ethernet, 10/100 , 3.3V, 1 Port, LQF	U35
02	UX193	IC, SMT, USB 2.0 Hub, 4-Port, HTQFP-64	U36
02	UX195	IC, SMT, Optocoupler, Quad, 3750Vrms ISO, SO16	U12, U17, U28
02	UX206	IC, SMT, Memory, 2Gb DDR3L SDRAM, 128Mx16, 96FBGA	U59, U60
02	UX208	IC, SMT, ADC, DUAL, 12BIT, 125MSPS, 64VQFN	U05
02	UX209	IC, SMT Current Limiting Power Distribution Switch	U81
02	UX64	IC,SMT,Power Supervisor,Dual I/P,33/1.5V,MSOP	U51
02	UX83	IC,SMT,2.5V Reference,0.1%,SOT -23-6	U34
02	XFPS10	Crystal,SMT,Fund,ParRes,32.768 kHz, 20ppm, 12.5pF,	Y03
02	XFPS16	Crystal, SMT, Fundamental, 24MHz, 18pF, 400	Y02
01	NAPF16A	PA LPF PWB Assy	A09
02	CT106	Capacitor,SMT,Porcelain,1.5pF, 1500V,+/-0.1pF	C06
02	CT107	Capacitor,SMT,Porcelain,1.8pF, 1500V,+/-0.1pF	C10
02	CT108	Capacitor,SMT,Porcelain,3.3pF, 1500V,+/-0.1pF	C08
02	CT109	Capacitor,SMT,Porcelain,5.6pF, 1500V,+/-0.1pF	C07, C09
02	HAC122	1 Pin Screw Terminal, Power Tap M3 Surface Mount	E01
02	LA77G	Inductor, SMT, Air Core, 2.5 turn, 10 AWG TCW, 0.5	L01
02	LA78G	Inductor, SMT, Air Core, 2.5 turn, 10 AWG TCW, 0.5	L02
02	LA79G	Inductor, SMT, Air Core, 2.5 turn, 10 AWG TCW, 0.4	L03

StockCode: NARF81A
Description: Final Assy, VX150/300/600,

Page 44 of 51

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
01	NAPI187A	System Interface PWB Assy	A03
02	CCJ01	Cap,SMT,Ceramic,1000pF,10%, 50V,X7R,0402	C02, C04, C11, C12, C14, C15, C53, C81, C82, C86
02	CCJ02	Cap,SMT,Ceramic,0.01uF,10%, 50V,X7R,0402	C19, C22, C47, C65, C83, C84
02	CCJ03	Cap,SMT,Ceramic,0.1uF,10%, 50V,X7R,0402	C01, C03, C05, C13, C16, C17, C18, C20, C21, C24, C25, C26, C27, C28, C29, C30,, C31, C32, C37, C38, C40, C41, C42, C43 C44, C45, C46, C48, C50, C51, C54, C55, C56, C57, C58, C59, C61, C63, C64, C66, C68, C69, C71, C72, C74, C77, C78, C79, C80
02	CCJ04	Cap,SMT,Ceramic,1uF,10%, 25V,X5R,0402	C08, C09, C23, C39, C73, C85
02	CCJ06	Cap,SMT,Ceramic,4.7uF,10%, 25V,X7R,0805	C52, C60, C62, C75
02	CCJ10	Cap,SMT,Ceramic,18pF,1%, 50V,C0G,0402	C67
02	CCJ18	Cap,SMT,Ceramic,22uF,20%, 25V,X5R,0805	C70, C76
02	CCJ20	Cap,SMT,Ceramic,15pF,1%, 50V,C0G,0402	C33, C35
02	CT112	Cap, SMT, Elect, Alum Polymer, 100uF, +/- 20%, 25V	C06, C07, C10
02	CT65	Cap, SMT, Ceramic, 6.8pF, 50V, +/-0.25pF, 1206	C49
02	HAJ66	Terminal, SMT, Test Point, PWB	TP03, TP14
02	JF47	Conn, Header,Square Post,Gold, Dual,40-pin	J12
02	JQ16	Conn, Header, SIP, 12 Pin Breakaway, 10 Ctr	J11
02	JR77	Terminal Block, 2 Pos, 300V, 13A, 28-14AWG, Spring	TB02
02	JR89	Terminal Block, 4 Pos, 300V, 26 - 20AWG, Spring C	TB01
02	JT188	Conn, Jack, MCX, 50Ohm, Gold, Vert, SMT	J05, J06, J09
02	JU131	Conn, Header, Shrouded, 4-pos, 3.00mm, Dual Row, G	J01, J02
02	JU84	Conn, Header, Shrouded, 0.050" 16pos, Dual Row, Go	J07
02	JU91	Conn, Header, Shrouded, 0.050" 10pos, Dual Row, Go	J04, J10
02	JU96	Conn, Header, Shrouded, 0.050" 20pos, Dual Row, Go	J03, J08
02	LCFS01	Inductor, SMT, Choke, 600ohms, 2A, 0805	L05, L06, L10, L11
02	LCFS02	Inductor, SMT, Choke, 2000 ohm s, 80mA, 0805	L08, L15, L16
02	LS18	Inductor,SMT,2.2uH,600ma,1210	L12
02	LS34	Inductor, SMT, 28nH, 2%, 4A 3.15mm H x 6.86mm L	L09
02	LS45	Inductor, SMT, Shielded, 33uH, 3.3A RMS	L03, L04
02	LS60	Inductor, SMT, 22uH, 4A RMS, Shielded, Pwr	L13
02	LS61	Inductor, SMT, 9.5nH, 480mArms, 5%, 0402	L17
02	QDLS02	Diode, SMT, LED, Yellow/Green, (570nm), 0603	DS01
02	QDSS01	Diode, SMT, Schottky, 30V, 0.2A, SOD-323	CR01, CR04, CR05
02	QN53	Transistor,SMT,MOSFET,N-Channel, 60v,115mA,SOT-23	Q01, Q02, Q03, Q04, Q05

StockCode: NARF81A
Description: Final Assy, VX150/300/600,

Page 45 of 51

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
02	QR82	Diode, SMT, TVS, Vw 5V, Vb 6V Vc 10.8V, SOT-143	CR02, CR03
02	RAD15	Resistor, SMT, MF, 150 Ohms, 1% 1/4W	R39, R40
02	RAD38	Resistor, SMT, MF, 12.1K Ohms, 1% 1/4W	R34
02	RAD93	Resistor, SMT, 0.01 ohms, 1%, 1/4W, 1206	R80
02	RAF24	Resistor SMT MF 68.1 Ohm 1% 1/16W 0402	R98
02	RAF27	Resistor SMT MF 121 Ohm 1% 1/16W 0402	R01, R03, R09, R12, R17, R20, R23, R26, R35, R38, R41, R53, R54, R61, R62, R63, R71, R72, R74,, R75, R76, R78, R84, R85 R86, R87, R91, R92, R93, R94
02	RAF34	Resistor SMT MF 475 Ohm 1% 1/16W 0402	R83, R88, R90, R95
02	RAF38	Resistor SMT MF 1000 Ohm 1% 1/16W 0402	R33
02	RAF42	Resistor SMT MF 2210 Ohm 1% 1/16W 0402	R02, R04, R43, R44, R46, R56, R57, R64, R68
02	RAF44	Resistor SMT MF 3320 Ohm 1% 1/16W 0402	R06, R08, R10, R11, R36, R52
02	RAF50	Resistor SMT MF 10.0K Ohm 1% 1/16W 0402	R05, R07, R13, R14, R15, R16, R29, R30, R31, R32, R37, R42, R47, R50, R51, R55, R65, R69, R79,, R81, R82, R89, R96
02	RAF54	Resistor SMT MF 22.1K Ohm 1% 1/16W 0402	R21, R22, R27, R28, R45, R48, R49, R58, R59, R60, R67, R70, R73
02	RAF56	Resistor SMT MF 33.2K Ohm 1% 1/16W 0402	R18, R24
02	RAF62	Resistor SMT MF 100K Ohm 1% 1/16W 0402	R19, R25, R66, R77
02	RAF83	Resistor SMT MF 499 Ohm 1% 1/16W 0402	R97
02	RFFS04	Resistor, SMT, MF, 1.50ohms, 1%, 1/10W, 0603	R99
02	RT50	Resistor,SMT,MF,0.0 ohms, Jumper,0805	L01, L02, L07, L14
02	UDTS04	IC,SMT,RS-485 Transceiver,3.3V ,SO-8	U07, U08
02	UDTS05	IC, SMT, RS-232 Transceiver, 3.3V, SO-16	U04
02	ULAS01	IC,SMT,Opamp,Quad,Single Supply,SOIC-14	U01
02	UT157	IC, SMT, DC-DC Conv, Buck, Adj, 2A, 4.5-28Vin, SOT	U06
02	UT158	IC, SMT, Amp, Current Sense, Precision, 50V/V, SOT	U05
02	UW207	Attenuator, SMT, 20dB, 50 ohm, 0.5W, DC to 8 GHz	U09
02	UX161	IC, SMT, Micro, 128K, 8K SRAM, 3.3V, TQFP-100	U02
02	UX191	IC, SMT, RMS RF Power detector , 3.3V, 40MHz-10GHz	U10
02	UX83	IC,SMT,2.5V Reference,0.1%,SOT -23-6	U03
02	XFPS14	Crystal,SMT,Fund,32.768kHz, 10ppm,12.5pF,50kOhm,-4	Y01
01	NAPI188/01	Power Supply Interface PWB Assy - 2kW	A04
02	CCFS09	Cap,SMT,Ceramic,0.47uF,10%,25V,X7R,0805	C02

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
02	CCFS52	Cap, SMT, Ceramic, 0.1uF, 10%, 25V X7R, 0603	C01, C03, C07, C09, C10, C11, C13, C15, C16, C17, C18, C20, C21, C23, C24
02	CCFS73	Cap, SMT, Ceramic, 1uF, 10%, 16V, X5R, 0603	C05, C14
02	CX33	Cap,SMT,Ceramic,4.7uF,20%,10V, X5R,1206	C06
02	HAC122	1 Pin Screw Terminal, Power Tap M3 Surface Mount	E01, E03
02	HAI66	Terminal, SMT, Test Point, PWB	TP2
02	JA121	Conn, PwrBlade, 3ACP+4P+24S, R/A,Solder Recp, 4mm	J01
02	JR78	Terminal Block, 3 Pos, 300V, 13A, 28-14AWG, Spring	TB1
02	JT202	Conn, Recept, AC, 250VAC, 20A, PWB Mount	J03
02	JU91	Conn, Header, Shrouded, 0.050" 10pos, Dual Row, Go	J02
02	LS23	Choke, SMT, Common Mode, 7000 ohm, 700mA	L01
02	RFC504	Resistor, SMT, 0.002 ohms, 1%, 5W	R28
02	RFFS01	Resistor,SMT,MF,0.0ohms,Jumper ,0603	R21, R31, R33, R35, R38
02	RFFS26	Resistor, SMT, MF, 100ohms, 1%, 1/10W, 0603	R09, R14
02	RFFS27	Resistor, SMT, MF, 121ohms, 1%, 1/10W, 0603	R04, R05, R06, R07
02	RFFS34	Resistor,SMT,MF,475ohms,1%, 1/10W,0603	R03, R10
02	RFFS38	Resistor,SMT,MF,1000ohms,1%, 1/10W,0603	R30
02	RFFS40	Resistor,SMT,MF,1500ohms,1%, 1/10W,0603	R25, R26
02	RFFS42	Resistor,SMT,MF,2210ohms,1%,1/10W,0603	R08, R16, R17, R19
02	RFFS43	Resistor, SMT, MF, 2740ohms, 1%, 1/10W, 0603	R11
02	RFFS50	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	R01, R02, R12, R13, R23, R24, R27
02	RFFS59	Resistor,SMT,MF,56.2Kohms,1%, 1/10W,0603	R18
02	ULAS02	IC,SMT,Opamp,Quad,Rail-To-Rail ,SOIC-14	U05
02	UP156	IC, SMT, Linear Voltage Regula tor, 3.3V, SOT-223	U01
02	US49	IC, SMT, ADC, 12 bit, 8 Ch, 3.3V, I2C	U02
02	UT74	IC, Amplifier, Instrumentation	U06
02	UX83	IC,SMT,2.5V Reference,0.1%,SOT -23-6	U03
01	NAP189	Analog Audio PWB Assy	A02
02	CCFS54	Cap,SMT,Ceramic,1500pF,10%,50V ,X7R,0603	C058, C074, C117, C118
02	CCJ01	Cap,SMT,Ceramic,1000pF,10%, 50V,X7R,0402	C001, C005, C006, C022, C023, C028, C029, C045
02	CCJ02	Cap,SMT,Ceramic,0.01uF,10%, 50V,X7R,0402	C036, C044, C061

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
02	CCJ03	Cap,SMT,Ceramic,0.1uF,10%, 50V,X7R,0402	C003, C007, C008, C010, C015, C016, C017, C018, C019, C020, C026, C031, C032, C034, C038, C039,, C051, C053, C056, C062, C065, C067, C082, C083, C085, C087, C088, C091, C095, C098, C100,, C104, C108, C111, C113, C115, C121, C124, C127, C131
02	CCJ04	Cap,SMT,Ceramic,1uF,10%, 25V,X5R,0402	C004, C009, C012, C014, C021, C024, C025, C027, C037, C041, C046, C050, C055, C063, C068, C069,, C073, C078, C081, C086, C092, C094, C101, C102, C103, C107, C112, C116, C119, C120
02	CCJ05	Cap,SMT,Ceramic,10uF,10%, 25V,X5R,0805	C033, C040, C054, C059, C070, C071, C072, C079, C090, C132
02	CCJ07	Cap,SMT,Ceramic,100pF,1%, 50V,C0G,0402	C048, C049, C057, C080, C089, C110, C128
02	CCJ08	Cap,SMT,Ceramic,2.2uF,10%, 25V,X5R,0402	C011, C035, C043, C060, C097
02	CCJ10	Cap,SMT,Ceramic,18pF,1%, 50V,C0G,0402	C093, C105, C114, C125
02	CCJ13	Cap,SMT,Ceramic,3300pF,10%, 50V,X7R,0402	C077
02	CCJ19	Cap,SMT,Ceramic,470pF,1%, 50V,C0G,0402	C042, C076, C122
02	CCJ20	Cap,SMT,Ceramic,15pF,1%, 50V,C0G,0402	C099
02	CCJ26	Cap,SMT,Ceramic,220pF,1%,50V, COG/NPO,0402	C052, C109
02	CCJ28	Cap,SMT,Ceramic,39pF,1%,50V, NPO/COG,0402	C075, C123
02	H AJ66	Terminal, SMT, Test Point, PWB	TP01, TP14
02	JT204	Conn, BNC, Dual Stacked, Isolated	J01
02	JT61	Conn, BNC, Recept, 50ohm,Insul , Rt Angle	J02
02	JT87	Conn,3-pin,PWB Mount, Fem, XLR	J03, J04
02	JU85	Conn, Header, Shrouded, 0.050" 30pos, Dual Row, Go	J05
02	LA72	Bead, Ferrite, SMT, 120 Ohm at 100MHz, 1.3A, 0402	L02
02	LS56	Inductor, SMT, 3.3uH, 5.6A,RMS	L01, L03, L04
02	QDDS02	Diode, SMT, Schottky, 40V, 1A, SMA	CR04
02	QDSS01	Diode, SMT, Schottky, 30V, 0.2A, SOD-323	CR03
02	QDZS11	Diode, SMT, Zener, 5.6V, 1.5W, SMA, 403D	CR01, CR02, CR05, CR06
02	RAD23	Resistor, SMT, MF, 681 Ohms, 1% 1/4W	R011, R052
02	RAF01	Resistor SMT MF 0.0 Ohm Jumper 0402	R034, R095, R099, R100, R123
02	RAF18	Resistor SMT MF 22.1 Ohm 1% 1/16W 0402	R090, R103, R144, R145
02	RAF26	Resistor SMT MF 100 Ohm 1% 1/16W 0402	R003, R018, R037, R038, R048, R069, R082, R097, R113, R131, R153

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
02	RAF38	Resistor SMT MF 1000 Ohm 1% 1/16W 0402	R007, R008, R009, R014, R015, R016, R031, R032, R044, R045, R046, R060, R061, R062, R109, R110,, R117, R125, R127, R128, R129, R136, R137, R149, R150
02	RAF50	Resistor SMT MF 10.0K Ohm 1% 1/16W 0402	R004, R005, R012, R019, R023, R025, R026, R027, R033, R035, R039, R041, R042, R050, R051, R053,, R056, R057, R058, R066, R070, R073, R074, R075, R080, R085, R086, R089, R093, R096, R098, R101,, R102, R104, R105, R106, R107, R108, R114, R119, R126, R134, R135, R146, R147, R148
02	RAF52	Resistor SMT MF 15.0K Ohm 1% 1/16W 0402	R021, R029, R079, R118
02	RAF56	Resistor SMT MF 33.2K Ohm 1% 1/16W 0402	R055
02	RAF57	Resistor SMT MF 39.2K Ohm 1% 1/16W 0402	R006, R013, R020, R043, R059, R072, R088, R111, R116, R141, R151
02	RAF59	Resistor SMT MF 56.2K Ohm 1% 1/16W 0402	R024, R028, R049, R054, R094
02	RAF63	Resistor SMT MF 121K Ohm 1% 1/16W 0402	R071
02	RAF66	Resistor SMT MF 221K Ohm 1% 1/16W 0402	R087, R120
02	RAF74	Resistor SMT MF 1.00M Ohm 1% 1/16W 0402	R001, R030
02	RAF87	Resistor SMT MF 3740 Ohm 1% 1/16W 0402	R010, R017, R047, R063
02	RAF93	Resistor SMT MF 7.15K Ohm 1% 1/16W 0402	R077, R083, R132, R139
02	RAF94	Resistor SMT MF 3.57K Ohm 1% 1/16W 0402	R078, R133
02	RAF95	Resistor SMT MF 4.12K Ohm 1% 1/16W 0402	R084, R091, R140, R142
02	RAF96	Resistor SMT MF 2.10K Ohm 1% 1/16W 0402	R092, R143
02	US12	IC, SMT, Rectifier, Bridge, 400V, 0.5A, SOIC-4	U02, U08, U21, U26
02	US58	IC, SMT, 24Bit Audio Codec, SPI, I2C, TSSOP28	U06
02	US59	IC, SMT, 10-Bit A/D Converter, 4Ch, 200KSPS, 10-VS	U03
02	US60	IC, SMT, ADC 16 Bit, 2Ch, 750KSPS, 16-WQFN	U17
02	UT170	IC, SMT, Adj. DC to DC Inverting Reg, 2.4A, 16-LFC	U20
02	UT171	IC, SMT, Op AMP, Dual, Low Noise, Bipol Supply, 8-	U01, U04, U09, U13, U15, U18, U19, U23
02	UT172	IC, SMT, Precision Diff Amp, 8-MSOP	U05, U10, U16, U25
02	UT178	IC, SMT, Rail to Rail Dual Op-amp, Wide BW, SOIC8	U14, U24
02	UX66	IC,SMT,Linear Regulator,150mA Adj.,MSOP-8	U07, U11, U12
02	UX83	IC,SMT,2.5V Reference,0.1%,SOT -23-6	U22
01	NAPI193	Front Panel User Interface Pwb Assy	A05
02	CCFS04	Cap,SMT,Ceramic,0.01uF,10%,50V,X7R,0603	C02, C03

StockCode: NARF81A
Description: Final Assy, VX150/300/600,

Page 49 of 51

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
02	CCFS07	Cap,SMT,Ceramic,0.1uF,10%,50V,X7R,0805	C04
02	CCJ18	Cap,SMT,Ceramic,22uF,20%, 25V,X5R,0805	C06
02	CT112	Cap, SMT, Elect, Alum Polymer, 100uF, +/- 20%, 25V	C05
02	JA140	Conn, USB, Vertical Mount, Type A, PWB	J04
02	JQ55	Conn, Header, Ribbon Cbl, 20 Pin	J03
02	JQ97	Conn, Header, SATA, Vert, PWB	J01
02	JU96	Conn, Header, Shrouded, 0.050" 20pos, Dual Row, Go	J02
02	LS18	Inductor,SMT,2.2uH,600ma,1210	L01
02	QM77	Diode, LED, RED, Rectangular, TH, 5mm x 2mm	DS1
02	QN53	Transistor,SMT,MOSFET,N-Channel, 60v,115mA,SOT-23	Q01, Q02, Q03, Q04, Q05
02	RFFS18	Resistor, SMT, MF, 22.1ohms, 1%, 1/10W, 0603	R20, R21
02	RFFS26	Resistor, SMT, MF, 100ohms, 1%, 1/10W, 0603	R12, R16
02	RFFS28	Resistor, SMT, MF, 150ohms, 1%, 1/10W, 0603	R03, R05, R06, R14, R18
02	RFFS50	Resistor,SMT,MF,10.0Kohms,1%,1/10W,0603	R02, R04, R07, R08, R09, R10, R11, R13, R15, R17, R19, R22, R23
02	SD94	Switch, Push-Button, Green/Red, MOM, SPST-NO, PWB	S01, S02
02	SD95	Switch, Push-Button, Tactile, SPST-NO, PWB	S03
02	UC107	Rotary Encoder, 20PPR, Quadrature, w / MOM Push Bu	U01
01	NAPP15A	Directional Coupler Bottom PWB Assy	A11
02	JT188	Conn, Jack, MCX, 50Ohm, Gold, Vert, SMT	J01, J02, J03
02	RT73	Resistor, Termination, 50 Ohm, +/- 5%, 60W, Tuned	R01
01	RX49	Thermistor,-30/105°C,10Kohms@ 25°C,Neg,Bvalue 3435	RT01, RT02
01	UA296	Cable Assembly, Flat IDC, 0.050" Tiger Eye, 16 con	W02
01	UA297	Cable Assembly, Flat IDC, 0.050" Tiger Eye, 20 con	W03
01	UA298	Cable Assembly, Flat IDC, 0.050" Tiger Eye, 20 con	W04

StockCode: NARF81A
Description: Final Assy, VX150/300/600,

Page 50 of 51

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
01	UA300	Cable Assembly, Flat IDC, 0.050" Tiger Eye, 10 con	W05
01	UA301	Cable Assembly, Flat IDC, 0.100" pitch, 20 cond, 2	W06
01	UA307	Cable, Coax, SRC 316, MCX(M) RA to MCX(M) Straight	W07, W08
01	UA309	Cable, Coax, SRC 316, MCX(M) RA to BNC(F) Bulkhead	W10
01	UA310	Cable, Coax, SRC 316, MCX(M) RA to MCX(M) RA, 12.0	W11
01	UA311	Cable, Coax, SRC 316, MCX(M) RA to MCX(M) RA, 16.0	W12
01	UA313	Cable, Coax, SRC 316, MCX(M) RA to MCX(M) Straight	W13
01	UA316	Cable, SATA, 0.5m, Straight F to Straight F, Shiel	W15
01	UA318	Cable Assembly, Flat IDC, 0.050" Tiger Eye,30 cond	W16
01	UG130	Power Supply, LED, 12V@150W, 90-305Vac, PFC, IP67	U02
01	UG132	Power Supply, 18-53Vdc, 47A, 2250W/1200W, 90-265Va	U03

StockCode: NARF81A
Description: Final Assy, VX150/300/600,

<u>Component Lvl.</u>	<u>StockCode</u>	<u>Description</u>	<u>Reference Designation</u>
01	UR119	Display, TFT LCD, 320x240 Graphic, 3.5", Color, SP	U01
01	ZAP68	Fan, 80mm, 12Vdc, PWM Ctrl, Tach, w/Conn+HS Tube +	B01, B02
END OF ITEM			

SECTION 3.3: WIRING INFORMATION

This section contains the wiring information for the transmitter, and applicable connector mating information.

Wiring Lists Provided

Wiring lists are provided in tabular format. [Table 3.3.1 on page 3-1](#) lists the tables containing wiring and cable information. These tables provide non-printed wiring pattern, point-to-point (source and destination) interconnection information.

Connector Mating Information

Where applicable, connector mating information is included with the associated wiring list. See the Source Mate and Destination Mate columns in [Table 3.3.4](#) and [Table 3.3.5](#).

Wire Colours

Every effort is made to manufacture assemblies using the wire colour shown in the **Colour** column of the wiring list tables. Sometimes, a white wire will be substituted for the listed colour. In such cases, wires must be identified by their assigned numbers.

Printed Wiring Board Patterns

Printed wiring pattern information for printed wiring boards (PWBs) is beyond the scope of this manual, and therefore not provided.

Table 3.3.1: Wiring Lists Provided

TABLE #	Description
Table 3.3.2	Wiring List - Wire Kit 1 PA (235-8102), VX150/VX300/VX600 and VX1 (page 3.3.2)
Table 3.3.3	Wiring List - Wire Kit 2 PA (235-8202), VX1.5/VX2 (page 3.3.2)
Table 3.3.4	Wiring List - Cable Information, VX150/VX300/VX600 and VX1 (page 3.3.2)
Table 3.3.5	Wiring List - Cable Information, VX1.5/VX2 (page 3.3.3)

Table 3.3.2: Wiring List - Wire Kit, 1 PA (235-8102), VX150/VX300/VX600 and VX1

Source	Destination	Wire #	Colour	Size	Remarks
A4E1	A7E1	1	White	10	Torque to 6 -in-lbs
A4E3	Ground near A7	2	Black	10	Torque to 6 -in-lbs
A4J3-2 (Ground)	Chassis Ground	3	Green/Yellow	14	Torque to 6 -in-lbs

Table 3.3.3: Wiring List - Wire Kit, 2 PA (235-8202), VX1.5/VX2

Source	Destination	Wire #	Colour	Size	Remarks
A4E2	A7E1	1	White	10	Torque to 6 -in-lbs
A4E4	Ground near A7	2	Black	10	Torque to 6 -in-lbs
A4J3-2 (Ground)	Chassis Ground	3	Green/Yellow	14	Torque to 6 -in-lbs
A4E1	A8E1	4	White	10	Torque to 6 -in-lbs
A4E3	Ground near A8	5	Black	10	Torque to 6 -in-lbs

Table 3.3.4: Cable Information, VX150/VX300/VX600 and VX1

Cable	Description	Nautel Part #	Source Mate	Destination Mate
*A14W1	Cable Assembly, Flat IDC, 0.100" pitch, 14 cond, 8.50"	UA322	A1J12	A14J1
W1	Not Used	-	-	-
W2	Cable Assembly, Flat IDC, 0.050" Tiger Eye, 16 cond, 2.25"	UA296	A3J7	A6J3
W3	Cable Assembly, Flat IDC, 0.050" Tiger Eye, 20cond, 3.25"	UA297	A1J11	A3J8
W4	Cable Assembly, Flat IDC, 0.050" Tiger Eye, 20 cond, 11.00"	UA298	A3J3	A5J2
W5	Cable Assembly, Flat IDC, 0.050" Tiger Eye, 10cond, 8.75"	UA300	A3J10	A4J2
W6	Cable Assembly, Flat IDC, 0.100" pitch, 20 cond, 2.00"	UA301	A5J3	U1CN1
W7	Cable, Coax, SRC 316, MCX(M) RA to MCX(M) Straight, 5.0"	UA307	A1J10	A6J1
W8	Cable, Coax, SRC 316, MCX(M) RA to MCX(M) Straight, 5.0"	UA307	A6J2	A3J6
W9	Not Used	-	-	-
W10	Cable, Coax, SRC 316, MCX(M) RA to BNC(F) Bulkhead, 10.0"	UA309	A11J1	RF MONITOR
W11	Cable, Coax, SRC 316, MCX(M) RA to MCX(M)RA, 12.0"	UA310	A11J3	A3J9
W12	Cable, Coax, SRC 316, MCX(M) RA to MCX(M)RA, 16.0"	UA311	A11J2	A1J9
W13	Cable, Coax, SRC 316, MCX(M) RA to MCX(M) Straight, 10.0"	UA313	A3J5	A7J1
W14	Not Used	-	-	-
W15	Cable, SATA, 0.5m, Straight F to Straight F, Shielded	UA316	A1J14	A5J1
W16	Cable Assembly, Flat IDC, 0.050" Tiger Eye, 30 cond, 2.00"	UA318	A1J17	A2J5

NOTE: * - denotes used only when Orban audio processor card is installed

Table 3.3.5: Cable Information, VX1.5/VX2

Cable	Description	Nautel Part #	Source Mate	Destination Mate
*A14W1	Cable Assembly, Flat IDC, 0.100" pitch, 14 cond, 8.50"	UA322	A1J12	A14J1
W1	Cable Assembly, Flat IDC, 0.050" Tiger Eye, 10cond, 2.25"	UA295	A3J4	A12J4
W2	Cable Assembly, Flat IDC, 0.050" Tiger Eye, 16 cond, 2.25"	UA296	A3J7	A6J3
W3	Cable Assembly, Flat IDC, 0.050" Tiger Eye, 20cond, 3.25"	UA297	A1J11	A3J8
W4	Cable Assembly, Flat IDC, 0.050" Tiger Eye, 20 cond, 11.00"	UA298	A3J3	A5J2
W5	Cable Assembly, Flat IDC, 0.050" Tiger Eye, 10cond, 8.75"	UA300	A3J10	A4J2
W6	Cable Assembly, Flat IDC, 0.100" pitch, 20 cond, 2.00"	UA301	A5J3	U1CN1
W7	Cable, Coax, SRC 316, MCX(M) RA to MCX(M) Straight, 5.0"	UA307	A1J10	A6J1
W8	Cable, Coax, SRC 316, MCX(M) RA to MCX(M) Straight, 5.0"	UA307	A6J2	A3J6
W9	Cable, Coax, SRC 316, MCX(M) RA to MCX(M) Straight, 5.0"	UA307	A3J5	A12J1
W10	Cable, Coax, SRC 316, MCX(M) RA to BNC(F) Bulkhead, 10.0"	UA309	A11J1	RF MONITOR
W11	Cable, Coax, SRC 316, MCX(M) RA to MCX(M)RA, 12.0"	UA310	A11J3	A3J9
W12	Cable, Coax, SRC 316, MCX(M) RA to MCX(M)RA, 16.0"	UA311	A11J2	A1J9
W13	Cable, Coax, SRC 316, MCX(M) RA to MCX(M) Straight, 10.0"	UA313	A12J2	A7J1
W14	Cable, Coax, SRC 316, MCX(M) RA to MCX(M) Straight, 10.0"	UA313	A12J3	A8J1
W15	Cable, SATA, 0.5m, Straight F to Straight F, Shielded	UA316	A1J14	A5J1
W16	Cable Assembly, Flat IDC, 0.050" Tiger Eye, 30 cond, 2.00"	UA318	A1J17	A2J5

NOTE: * - denotes used only when Orban audio processor card is installed

SECTION 3.4: ELECTRICAL SCHEMATICS

This section contains electrical schematics and logic diagrams for the transmitter. Block diagrams, simplified electrical schematics, and logic diagrams may be included. Refer to [Table 3.4.1 on page 3.4.5](#) for an itemized listing.

Component Values

Unless otherwise specified on the logic or schematic diagram, the following defaults apply:

-  5 Capacitor values are shown in microfarads (uF) (e.g. 5 uF)
-  10 Resistor values are shown in ohms (e.g. 10 ohms; K = 1,000 and M = 1,000,000)
Resistor power ratings are not shown when less than 0.5 W
-  Unidentified diodes are part number BAS21HT1 (Nautel Part # QDRS01)
-  24V Unidentified transient suppressors are part number 0603E SDA-TR1 (Nautel Part # QR70)

Graphic and Logic Symbols

The graphic symbols used on electrical schematics are in accordance with American National Standard ANSI Y32.2-1975 - Graphic Symbols for Electrical and Electronic Diagrams.

The logic symbols used on electrical schematics and logic diagrams are in accordance with American National Standard ANSI Y32.14-1975 - Graphic Symbols for Logic Diagrams.

Reference Designations

Referenced designations were assigned in accordance with American Society of Mechanical Engineers ASME Y14.44-2008 - Reference Designations for Electrical and Electronic Parts and Equipment.

Each electrical symbol is identified with its basic reference designation. To obtain the full reference designation for a specific part, prefix this basic identifier with the reference designation assigned to all higher assemblies. For example, the complete designation for a resistor (R1) on a printed wiring board (A1), that is part of a larger board (A2), would be A2A1R1.

Unique Symbols

Nautel uses unique symbols on electrical schematics to describe logic (two-state) signals. These signals differ from single-state signals or analog signals that may have multiple values.

Type of Inputs and Outputs

On electrical schematics, names used to describe logic (two-state) input and output signals are prefixed with a # symbol.

Logic Level Convention

The # prefix identifies an input or output signal that has two distinct states: high and low.

The suffix on an input or output signal name identifies the active (true) state of the signal. The high suffix (+) indicates the more positive of the two levels used to represent the logic states. The low suffix (-) indicates the less positive of the two levels.

Two types of logic, positive and negative, may be represented on a particular schematic. In positive logic, high represents the active (true) state, and low represents the inactive (false) state. In negative logic, low represents the active (true) state, and high represents the inactive (false) state.

Identifying Schematic Diagrams

Each electrical schematic in this section is identified by a number that is both the figure number and the page number. The numbers are assigned sequentially and are prefixed by the letters SD. The electrical schematics and logic diagrams included in this section are listed in [Table 3.4.1 on page 3.4.5](#).

Structure of Schematics

The electrical schematics are structured in a hierarchical format that is based on function and signal flow. Wherever practical, the signal flow is from left to right. Normally, inputs originate on the left-hand side and outputs extend to the right-hand side. Exceptions are shown by an arrow indicating the direction of signal flow.

NOTE: *The physical location of a part or assembly was not necessarily a factor during creation of the schematic. The full reference designation assigned to a part or assembly, in conjunction with the family tree (see [Parts Information on page 3.2.1](#)) and the assembly detail drawings (see [Mechanical Drawings on page 3.5.1](#)), will identify its location.*

Figures SD-1 through SD-6 identify each major stage and its detailed interconnection. Each stage contains cross-references that identify which blocks are the signal sources for inputs, or the destinations for outputs.

When a sub-function is treated as a block in Figures SD-1 through SD-6, its detailed circuit information is included in its own schematic drawing(s), which is also included in this section.

Locating Schematic Diagram(s) for a Functional Block

The text inside a functional block provides the key to locating its schematic diagram(s).

1. When a functional block is assigned a reference designation (e.g., A2), refer to the family trees in [Parts Information on page 3.2.1](#). Follow the family tree branches to the block that contains the desired reference designation, and associated Nautel nomenclature (e.g., NAPI187A System Interface PWB).
2. Refer to [Table 3.4.1 on page 3.4.5](#) and use the reference designation and Nautel nomenclature to identify the appropriate schematic diagram(s).
Example: NAPI187A System Interface PWB is shown on schematics SD-9 and SD-10.
3. If necessary, refer to the referenced figure in the schematics at the end of this section and locate the next, lower-level assembly. Then, repeat this procedure until the desired schematic diagram is found.

Locating a Part or Assembly on a Schematic

The full reference designation assigned to a part or assembly is the key to physically locating that part or assembly.

NOTE: *Full reference designations contain the assembly hierarchical coding. When the end item is divided into units (cabinets), the first coding is a unit number (1, 2, 3, etc.). When the end item is divided into assemblies, the first coding is an assembly number (A1, A2, A3, etc.). If a unit or an assembly is divided into sub-assemblies, assembly coding that identifies assembly relationship (1A1, A2A1, A2A1A1, etc.) is added.*

1. Refer to the family trees in [Parts Information on page 3.2.1](#).
2. Follow the family tree branches to the block that contains the desired reference designation, while noting the Nautel nomenclatures and names of all higher assemblies in the path. Example: A2 NAPI187A System Interface PWB.

NOTE: *The drawings in the Mechanical Drawings section depict the assembly detail of the transmitter and its modules and assemblies.*

3. Refer to [Table 3.5.1 in Mechanical Drawings on page 3.5.1](#). Use the Nautel nomenclature and name of each family tree block in the path, starting at the highest assembly – this is normally Figure MD-1 – to determine the figure number(s) for that assembly. Example: NAPI187A System Interface PWB is shown on MD-4.
4. Refer to the referenced figure (e.g., MD-4) in [Mechanical Drawings on page 3.5.1](#) to locate the desired part or assembly.

Table 3.4.1: List of Electrical Schematics

Figure #	Title
SD-1	VX150/VX300/VX600 System Schematic (Sheet 1 of 2)
SD-2	VX150/VX300/VX600 System Schematic (Sheet 2 of 2)
SD-3	VX1 Transmitter System Schematic (Sheet 1 of 2)
SD-4	VX1 Transmitter System Schematic (Sheet 2 of 2)
SD-5	VX1.5/VX2 Transmitter System Schematic (Sheet 1 of 2)
SD-6	VX1.5/VX2 Transmitter System Schematic (Sheet 2 of 2)
SD-7	NAPI189 Analog Audio PWB (Sheet 1 of 2)
SD-8	NAPI189 Analog Audio PWB (Sheet 2 of 2)
SD-9	NAPI187A System Interface PWB (Sheet 1 of 2)
SD-10	NAPI187A System Interface PWB (Sheet 2 of 2)
SD-11	NAPI188/01 Power Supply Interface PWB (VX150/VX300/VX600)
SD-12	NAPI188 Power Supply Interface PWB (VX1/VX1.5/VX2)
SD-13	NAPI193 Front Panel User Interface PWB
SD-14	NAPA41 Pre-Amp/IPA PWB
SD-15	NAPA40A Power Amplifier PWB
SD-16	NAPF16A Low Pass Filter PWB
SD-17	NAPP15A Directional Coupler Bottom PWB
SD-18	NAPH15 2-Way Splitter PWB (VX1.5/VX2)

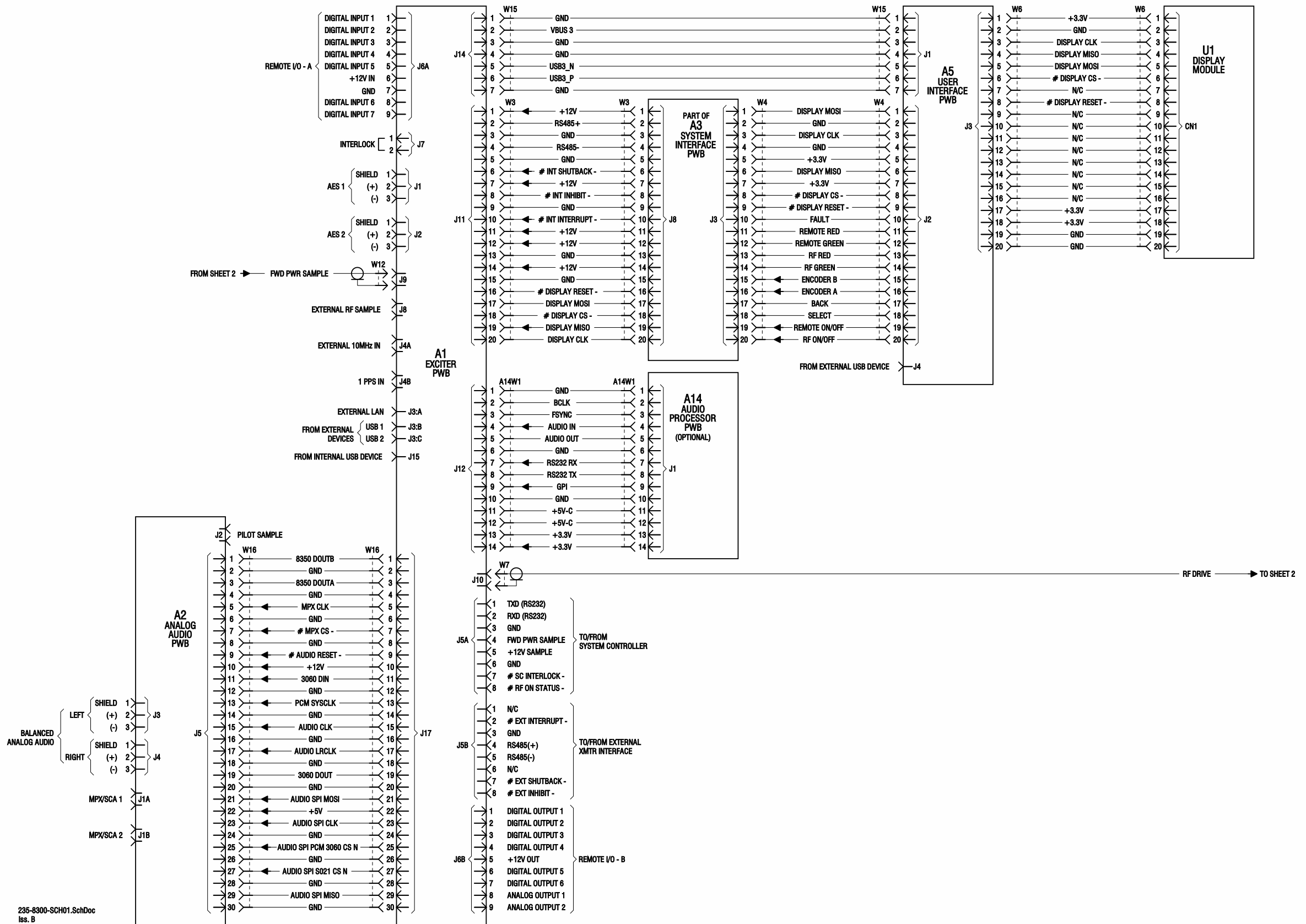
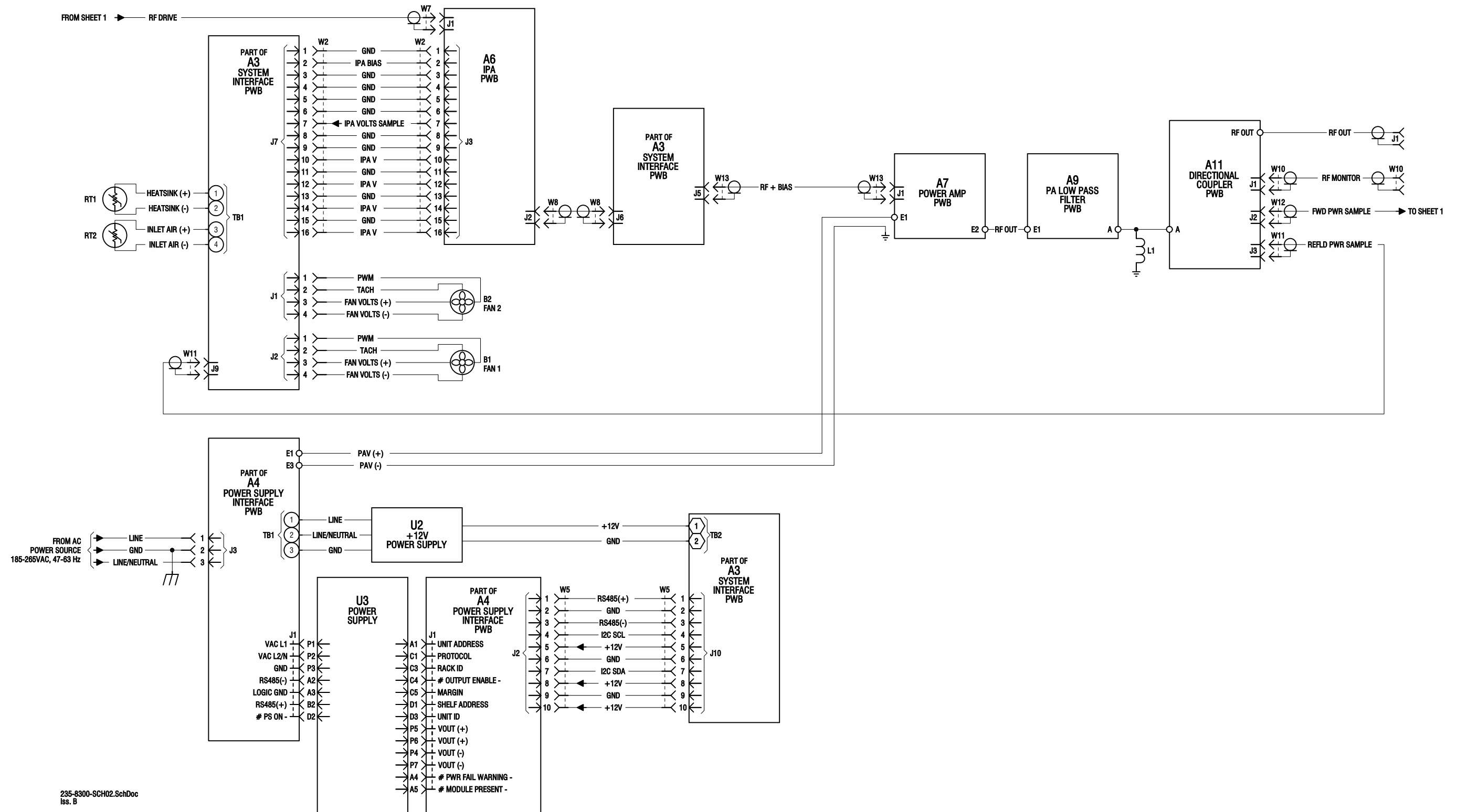


Figure SD-1: VX150/VX300/VX600 System Schematic (Sheet 1 of 2)



235-8300-SCH02.SchDoc
Iss. B

Figure SD-2: VX150/VX300/VX600 System Schematic (Sheet 2 of 2)

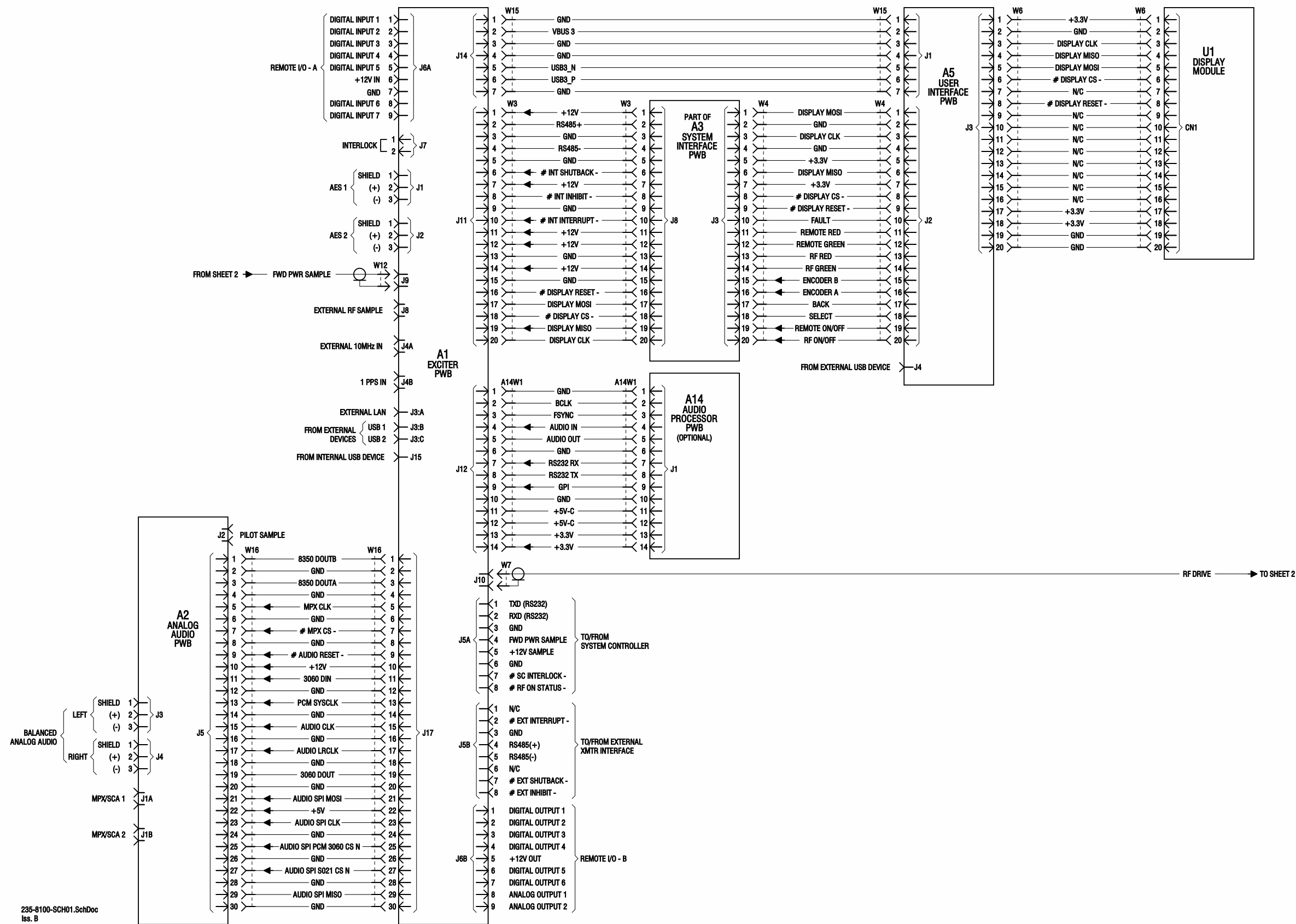


Figure SD-3: VX1 System Schematic (Sheet 1 of 2)

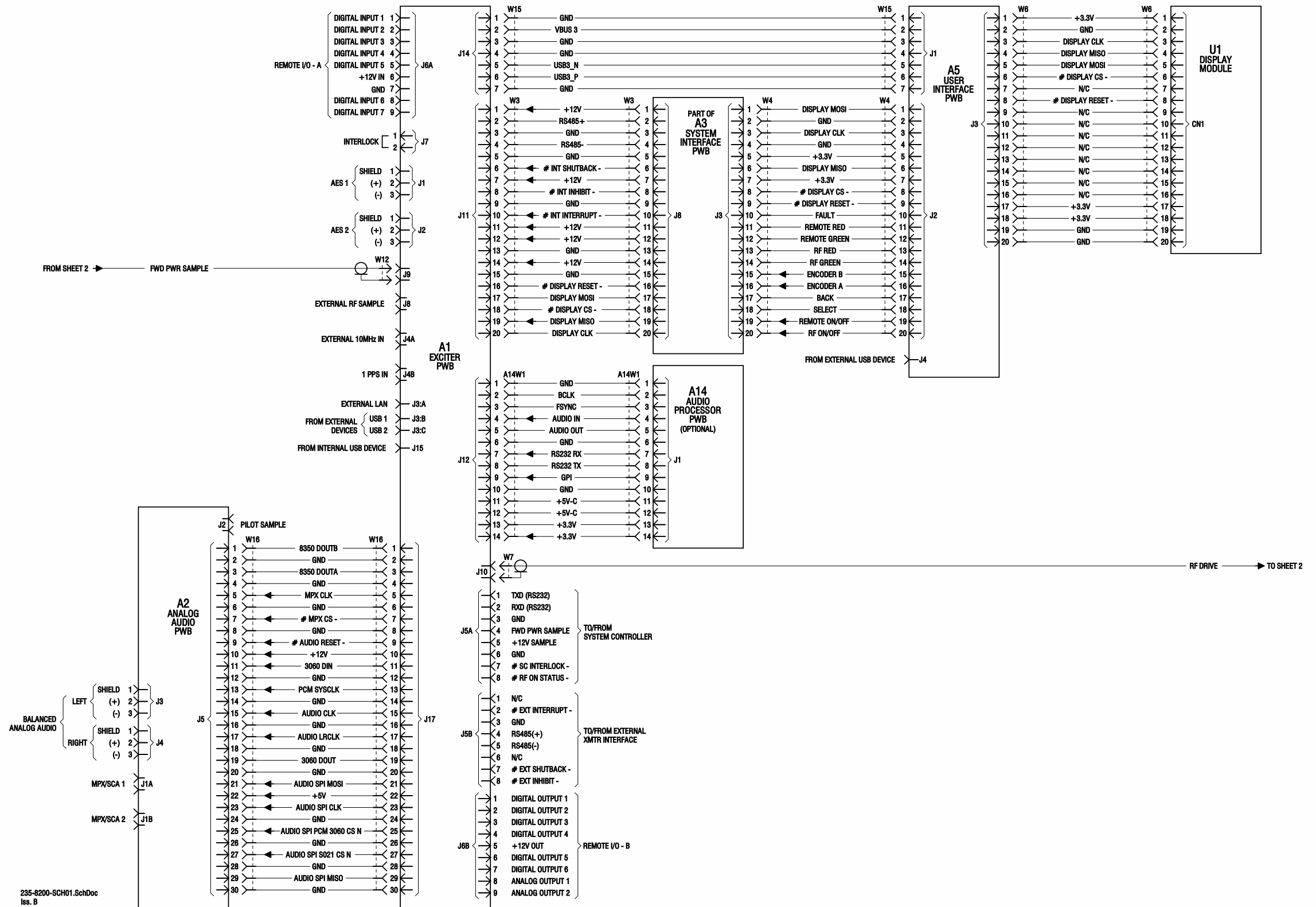


Figure SD-5: VX1.5/VX2 System Schematic (Sheet 1 of 2)

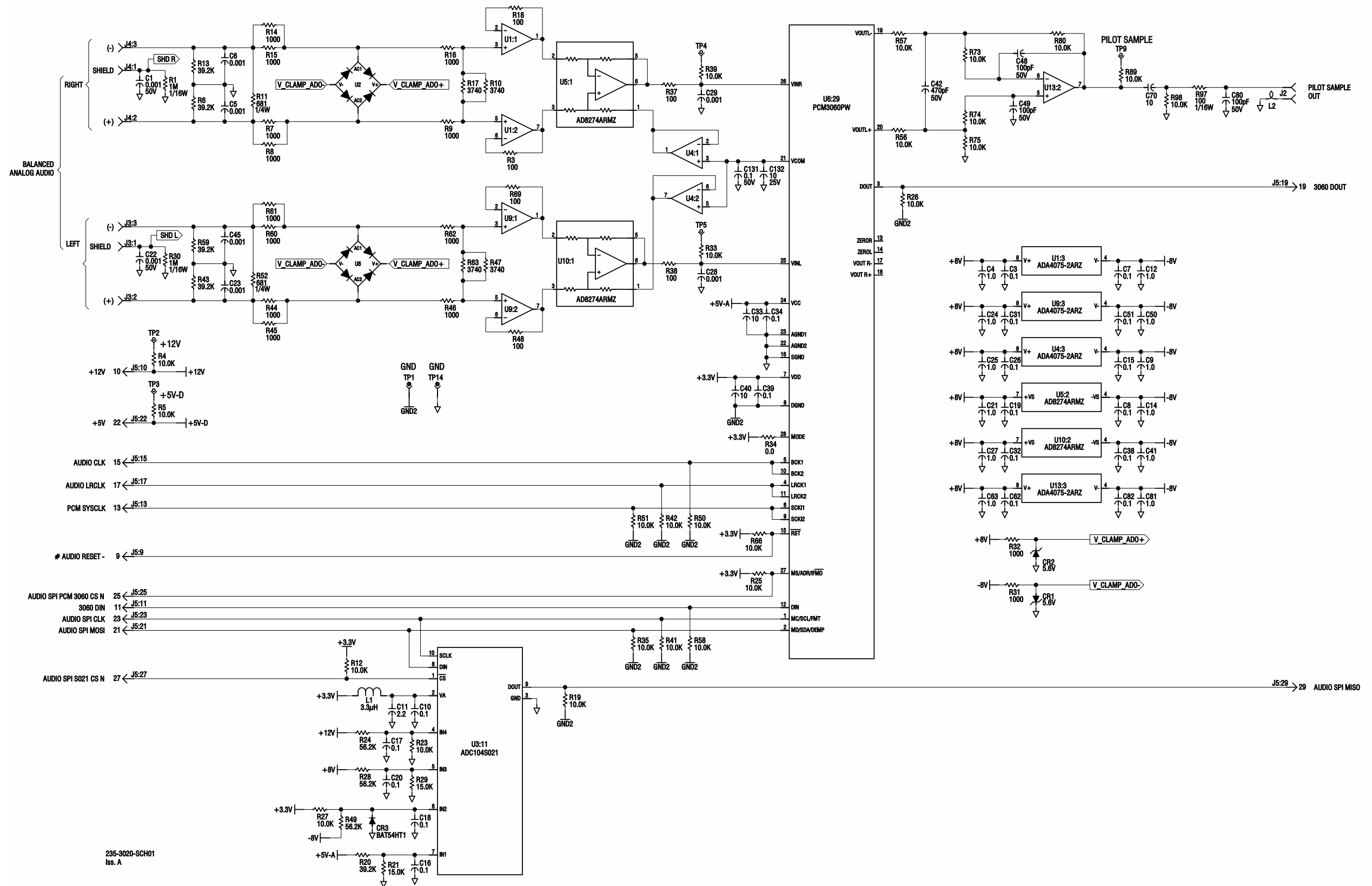


Figure SD-7: NAPI189 Analog Audio PWB (Sheet 1 of 2)



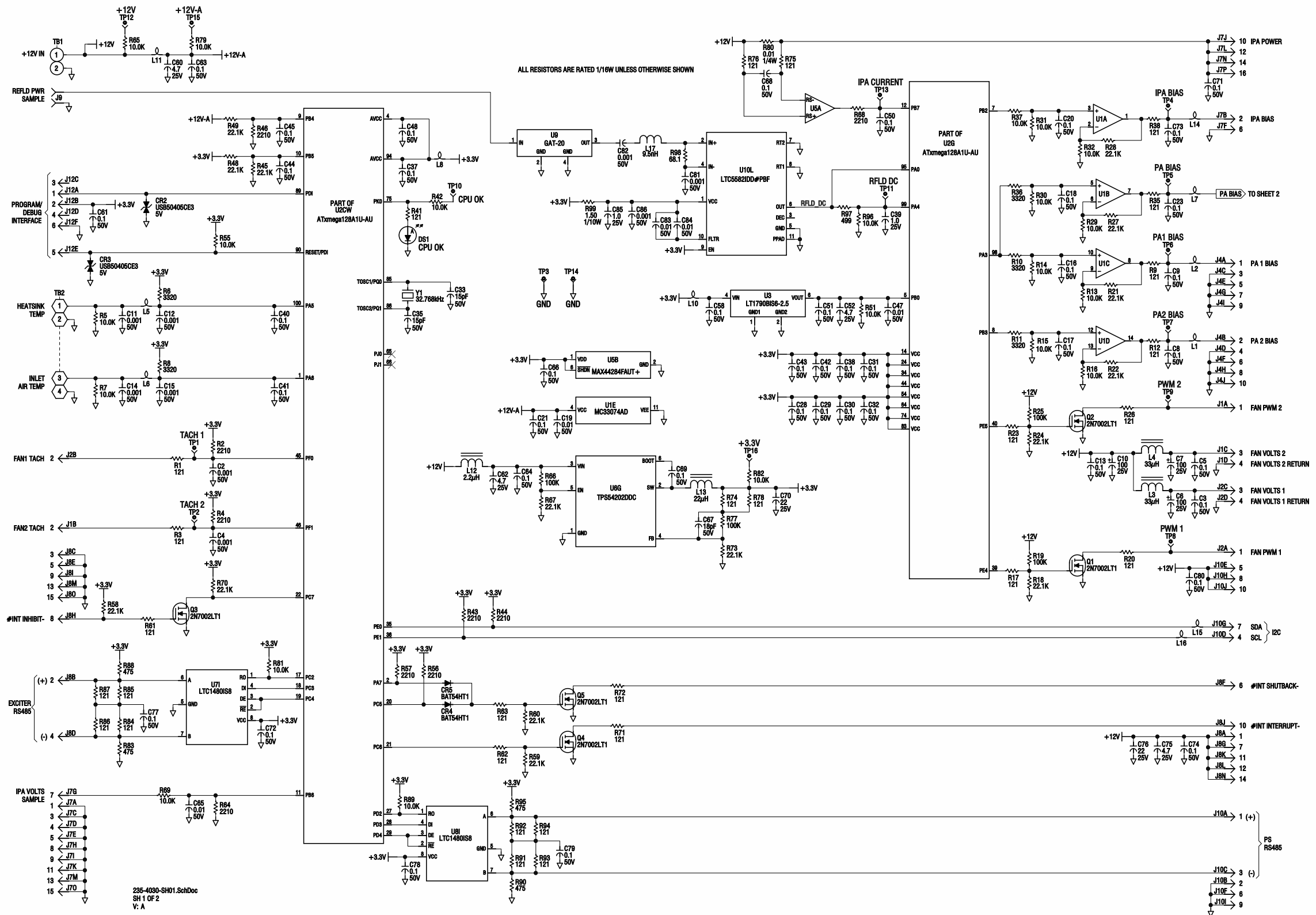
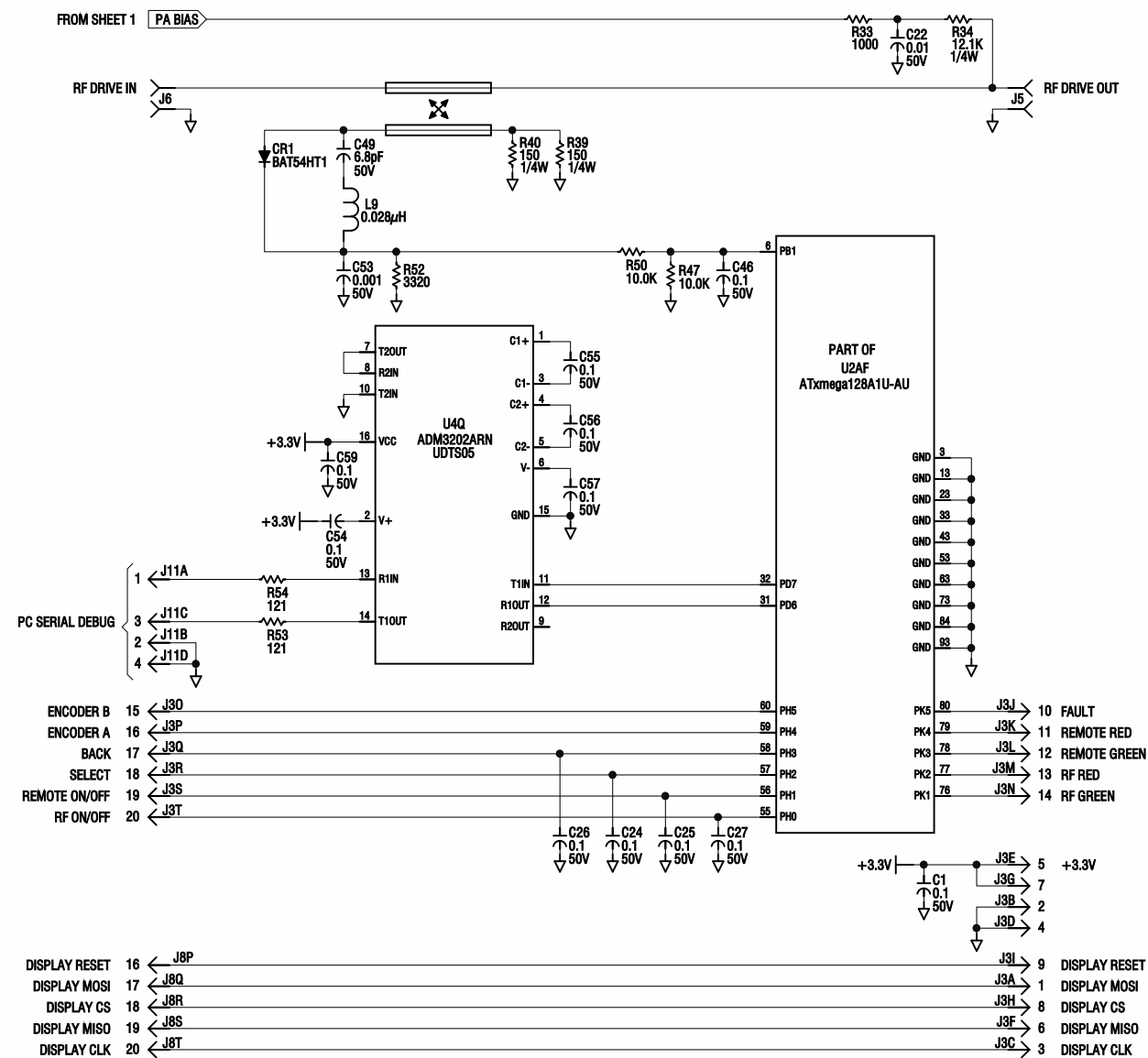


Figure SD-9: NAPI187A System Interface PWB (Sheet 1 of 2)



235-4030-SH02.SchDoc
SH 2 of 2
V: A

Figure SD-10: NAPI187A System Interface PWB (Sheet 2 of 2)

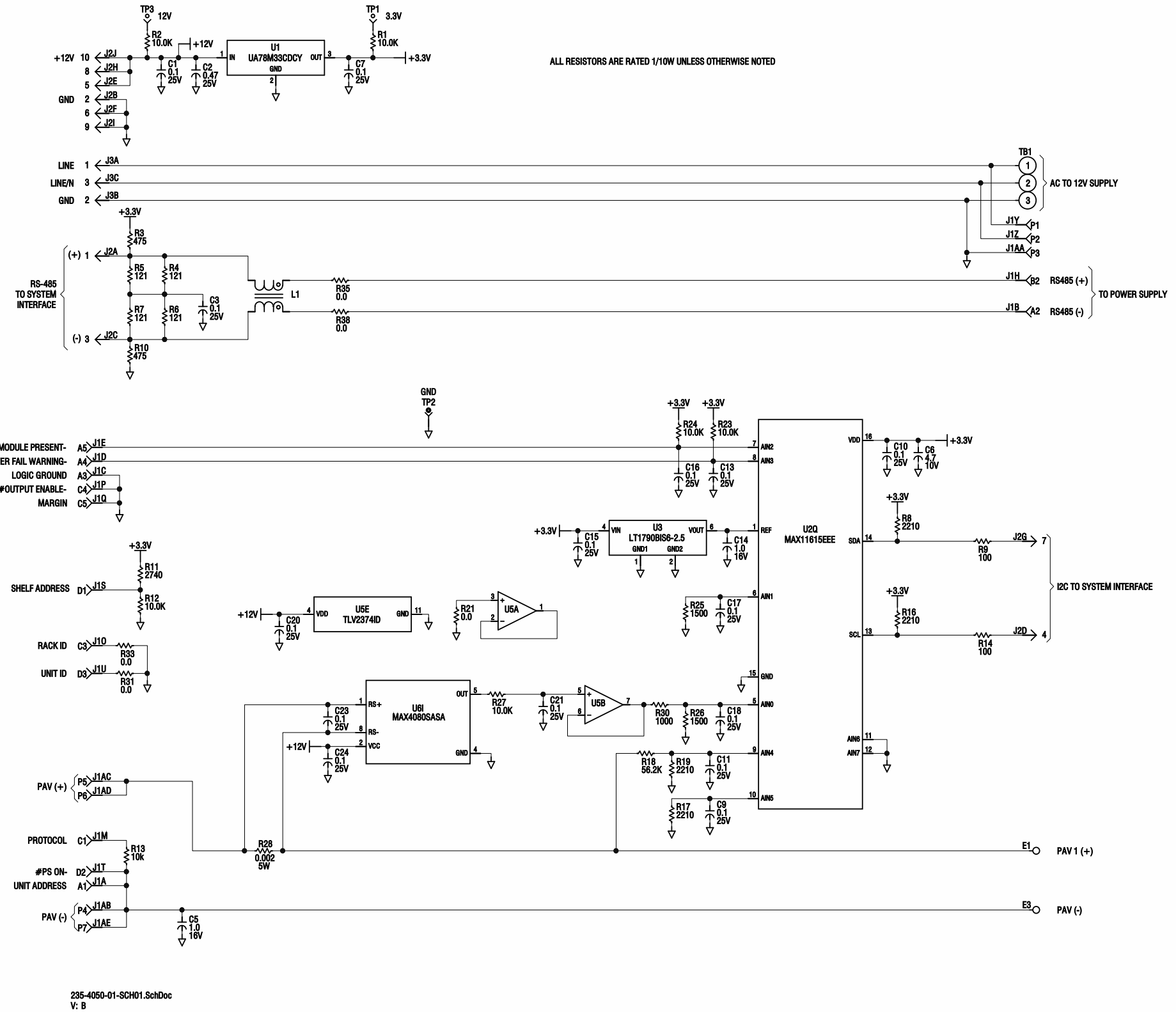


Figure SD-11: NAPI188/01 Power Supply Interface PWB (VX150/VX300/VX600)

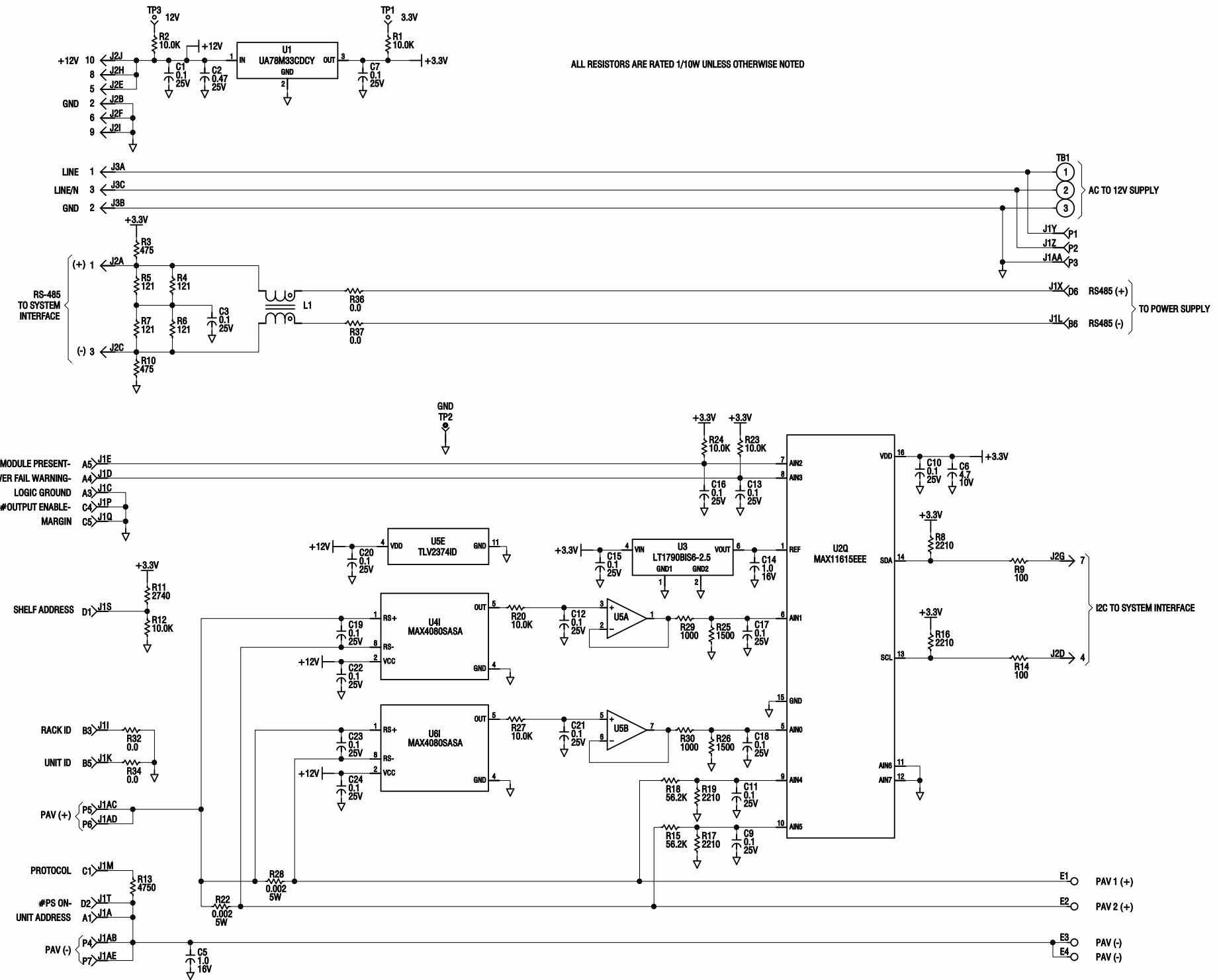


Figure SD-12: NAPI188 Power Supply Interface PWB (VX1/VX1.5/VX2)

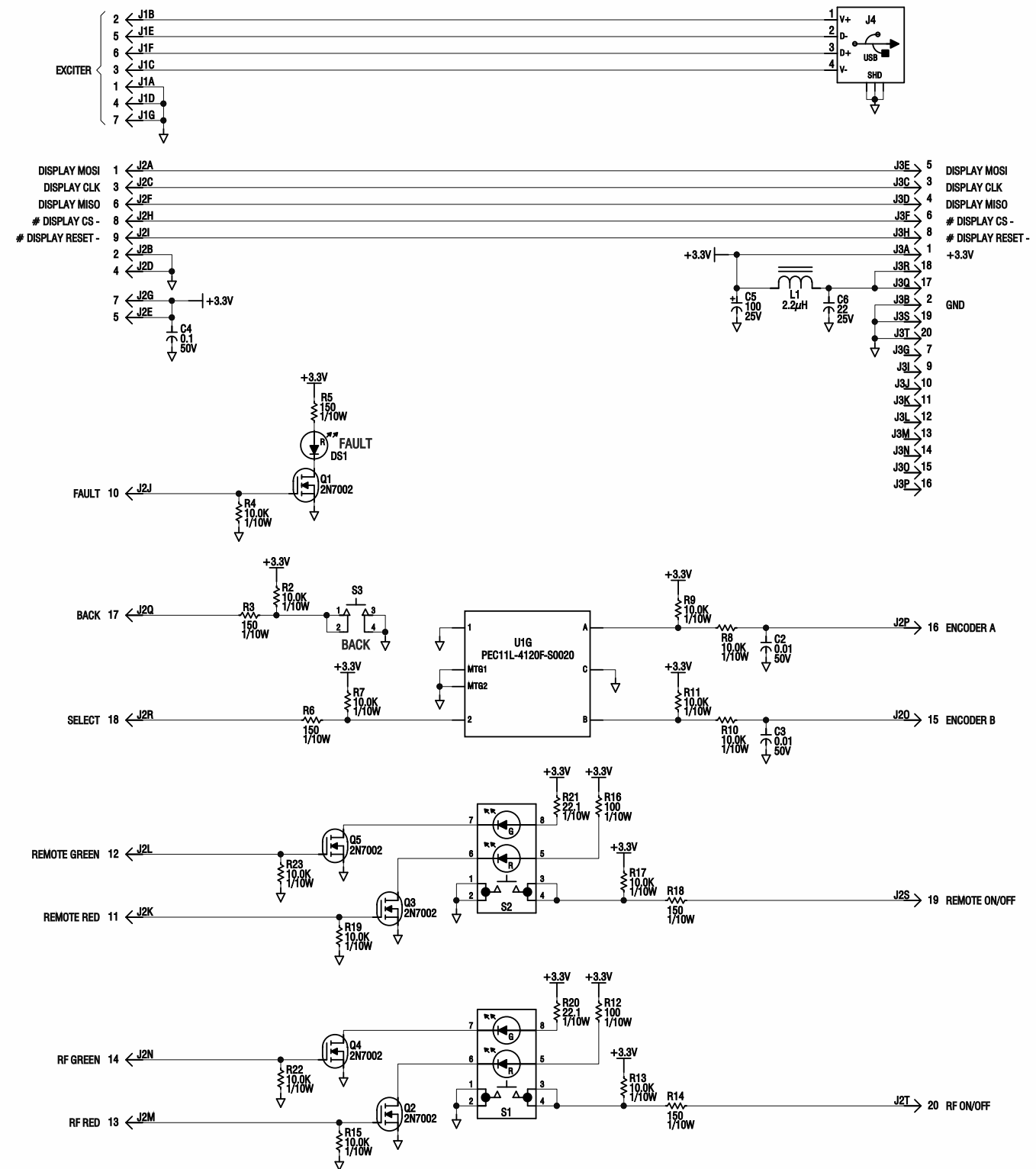


Figure SD-13: NAPI193 Front Panel User Interface PWB

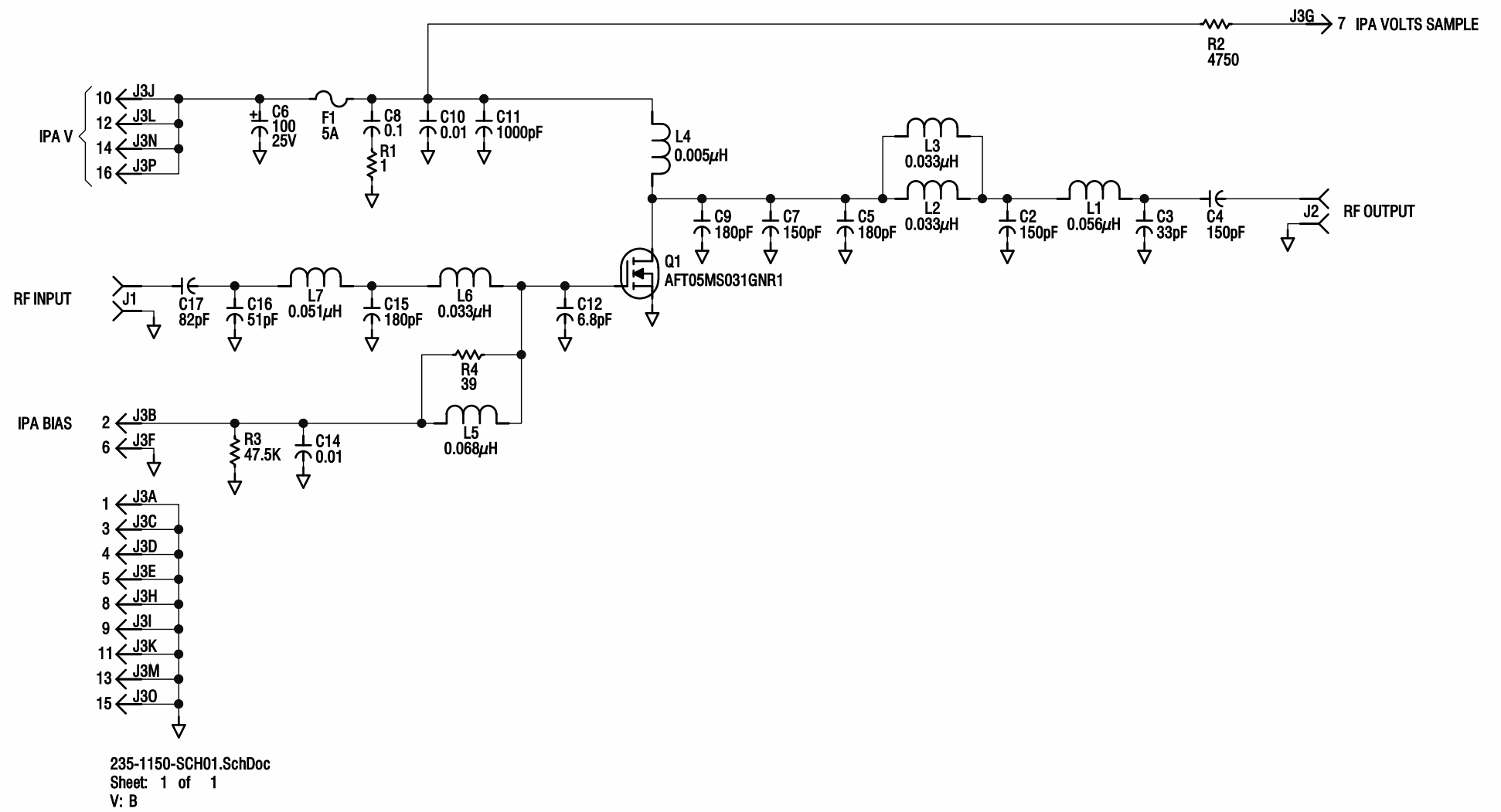


Figure SD-14: NAPA41 Pre-Amp/IPA PWB

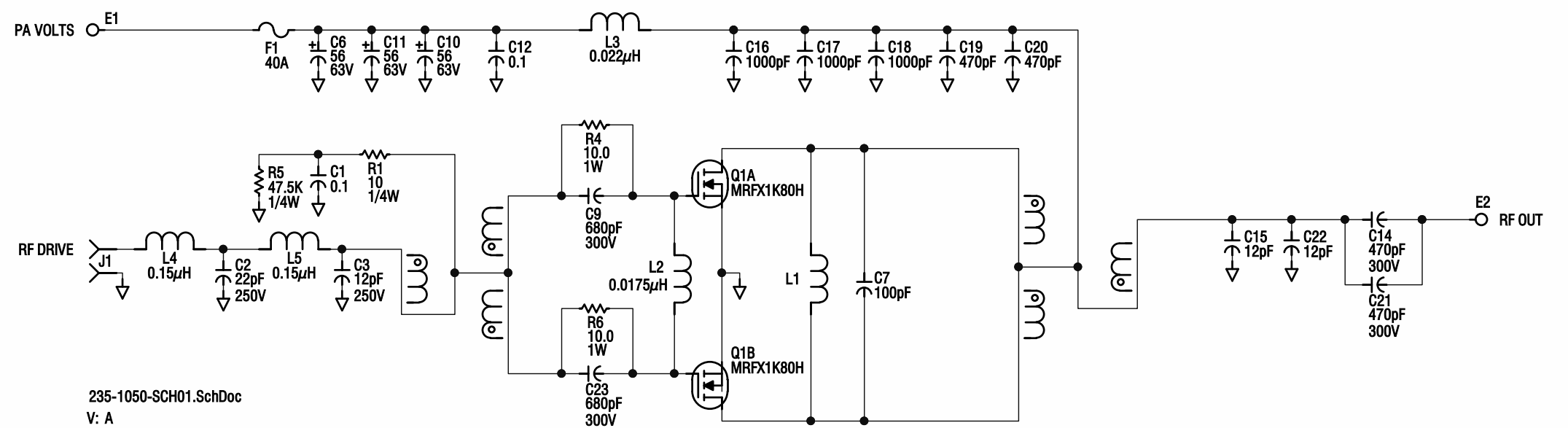


Figure SD-15: NAPA40A Power Amplifier PWB

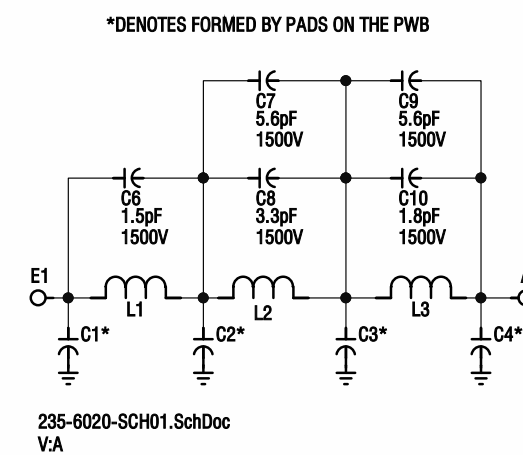


Figure SD-16: NAPF16A Low Pass Filter PWB

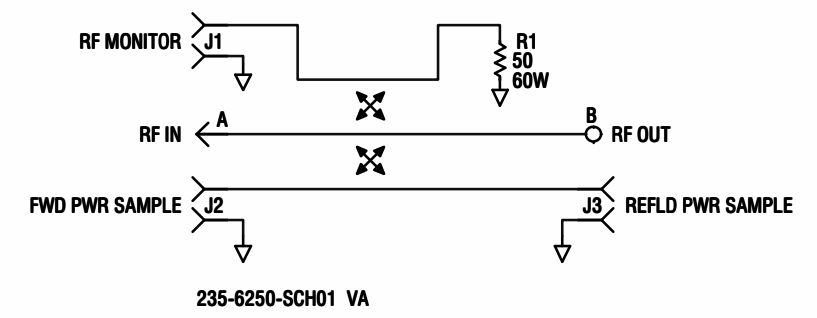
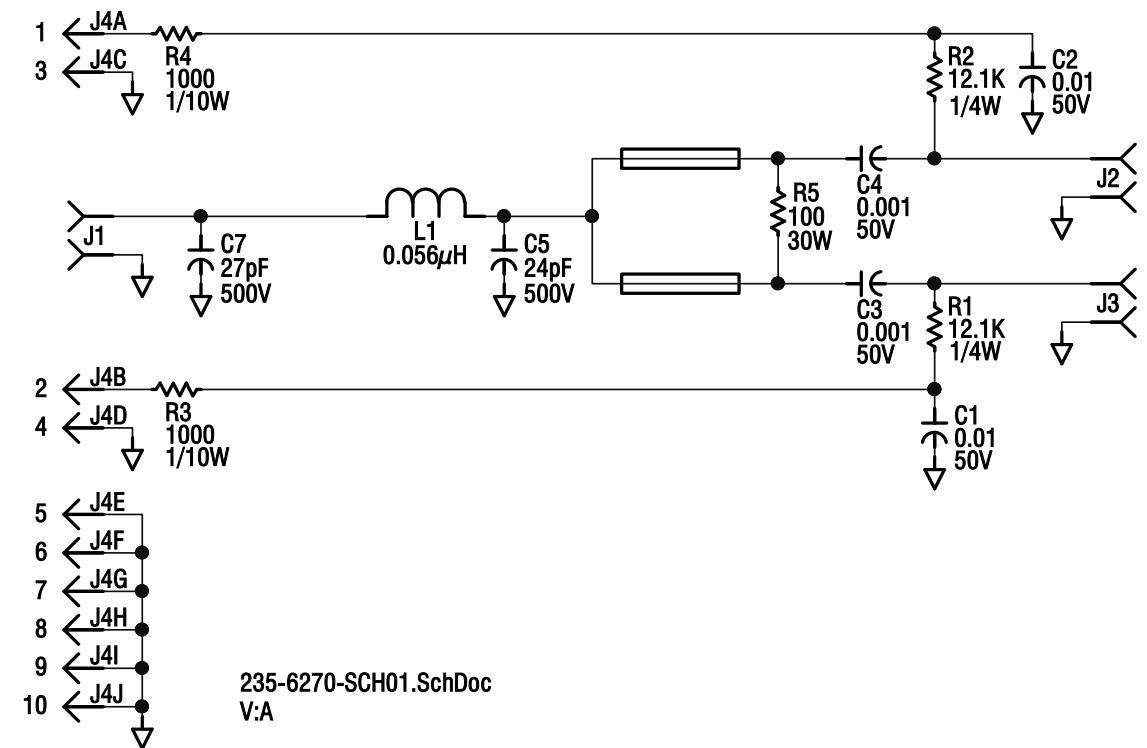


Figure SD-17: NAPP15A Directional Coupler Bottom PWB



235-6270-SCH01.SchDoc
V:A

Figure SD-18: NAPH15 2-Way Splitter PWB (VX1.5/VX2)

SECTION 3.5: MECHANICAL DRAWINGS

This section contains mechanical drawings for assemblies of the transmitter. Dimensional drawings may be included. Refer to [Table 3.5.1 on page 3.5.2](#) for an itemized list.

Assembly detail drawings for assemblies and modules that have separate manuals are not included. Refer to the appropriate maintenance manual for the assembly detail of these assemblies.

Identifying Mechanical Drawings

Each mechanical drawing in this section is identified by a number that is both the figure number and the page number. The numbers are assigned sequentially and are prefixed by the letters MD. Drawings in this section are listed in [Table 3.5.1 on page 3.5.2](#).

Content of Mechanical Drawings

Mechanical drawings are illustrations that depict the location of electrical components and show assembly outline detail. Dimensional information is included, where appropriate.

When a module or assembly is the subject of its own assembly detail drawing, and it is also shown in a higher level assembly, the detail depicted in the higher level assembly may have minor differences from the module or assembly actually installed. In this case, always refer to the assembly detail drawing of the module or assembly for detailed information.

Locating a Part or Assembly on a Mechanical Drawing

1. When a part or assembly is assigned a reference designation (e.g., *A1* or *A1R1*), refer to the family trees in [Parts Information on page 3.2.1](#). Follow the family tree branches to the block that contains the desired reference designation and Nautel nomenclature (e.g., *NAPA40A Power Amplifier PWB*). Note the reference designations and Nautel nomenclatures of all higher assemblies in the path. Example: *A7 NAPA40A Power Amplifier PWB*.
2. Refer to [Table 3.5.1 on page 3.5.2](#). Use the reference designation and Nautel nomenclature to identify the appropriate mechanical drawing. Example: *NAPA40A Power Amplifier PWB is shown on mechanical drawing MD-12*.
3. If necessary, refer to the referenced figure (e.g., *MD-12*) in the mechanical drawings at the end of this section and locate the next, lower-level assembly. Then, repeat this procedure until the desired part or assembly is found.

Table 3.5.1: List of Mechanical Drawings

Figure #	Title
MD-1	VX150/VX300/VX600/VX1 Transmitter (top view)
MD-2	VX150/VX300/VX600/VX1 Transmitter (side view)
MD-3	VX1.5/VX2 Transmitter (top view)
MD-4	VX1.5/VX2 Transmitter (side view)
MD-5	VX Transmitter (front view)
MD-6	NAPI189 Analog Audio PWB
MD-7	NAPI187A System Interface PWB
MD-8	NAPI188/01 Power Supply Interface PWB (VX150/VX300/VX600)
MD-9	NAPI188 Power Supply Interface PWB (VX1/VX1.5/VX2)
MD-10	NAPI193 Front Panel User Interface PWB
MD-11	NAPA41 Pre-Amp/IPA PWB
MD-12	NAPA40A PA PWB
MD-13	NAPF16A PA LPF PWB
MD-14	NAPP15A Directional Coupler Bottom PWB
MD-15	NAPH15 2-Way Splitter PWB (VX1.5/VX2)
MD-16	2-Way Combiner PWB (Nautel Part # PU03B) (VX1.5/VX2)

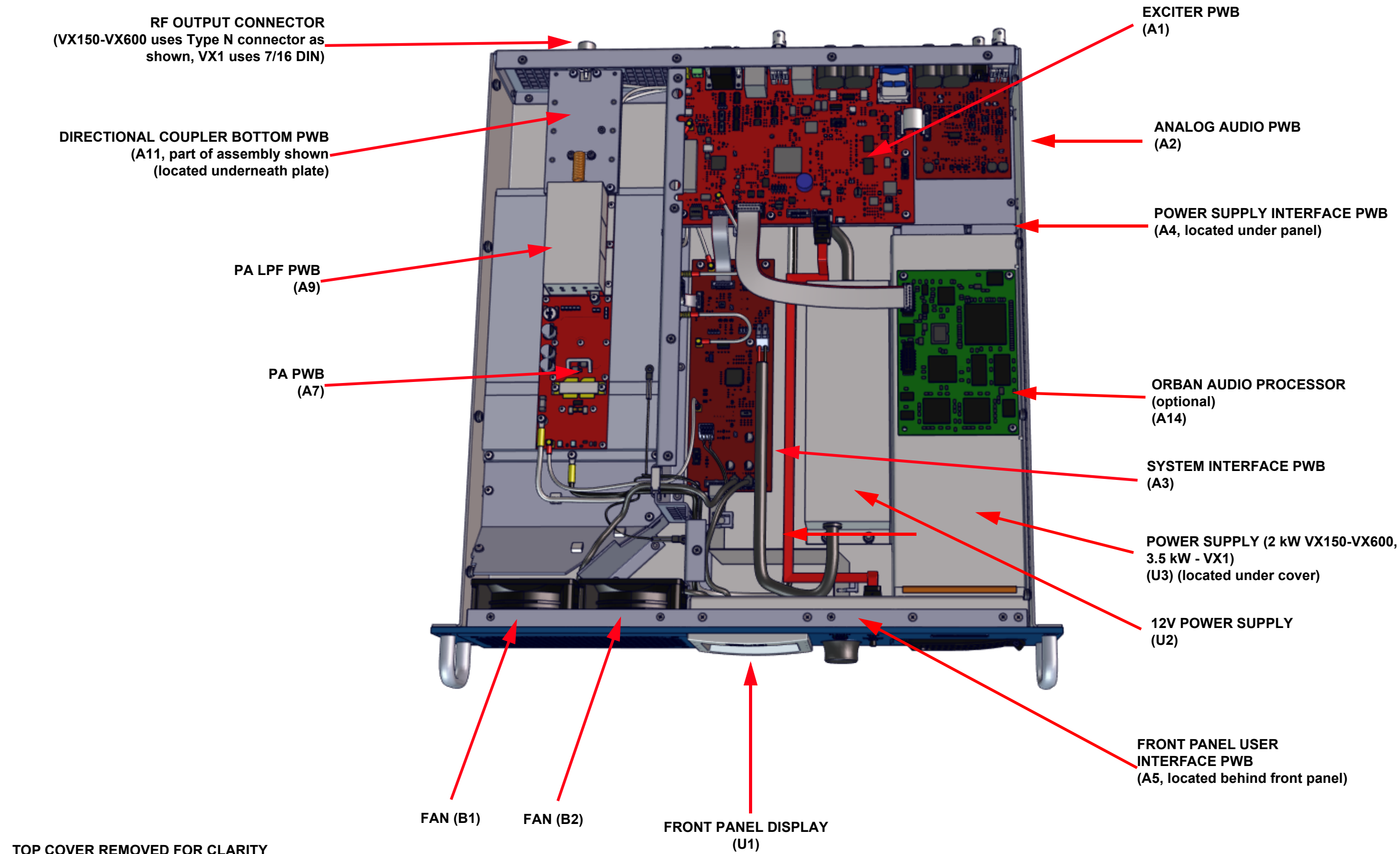
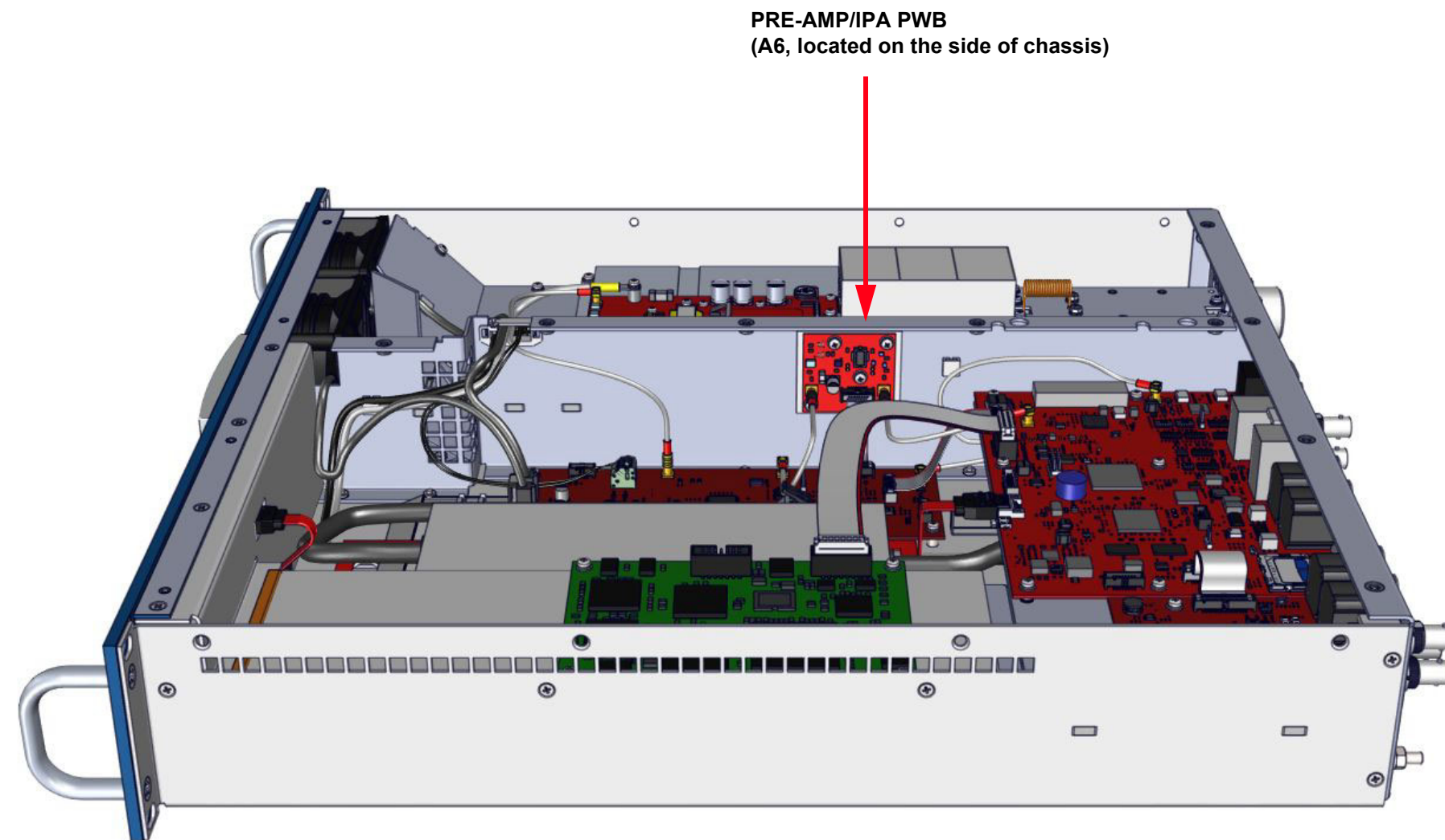


Figure MD-1: VX150/VX300/VX600/VX1 Transmitter (top view)



TOP COVER REMOVED FOR CLARITY

Figure MD-2: VX150/VX300/VX600/VX1 Transmitter (side view)

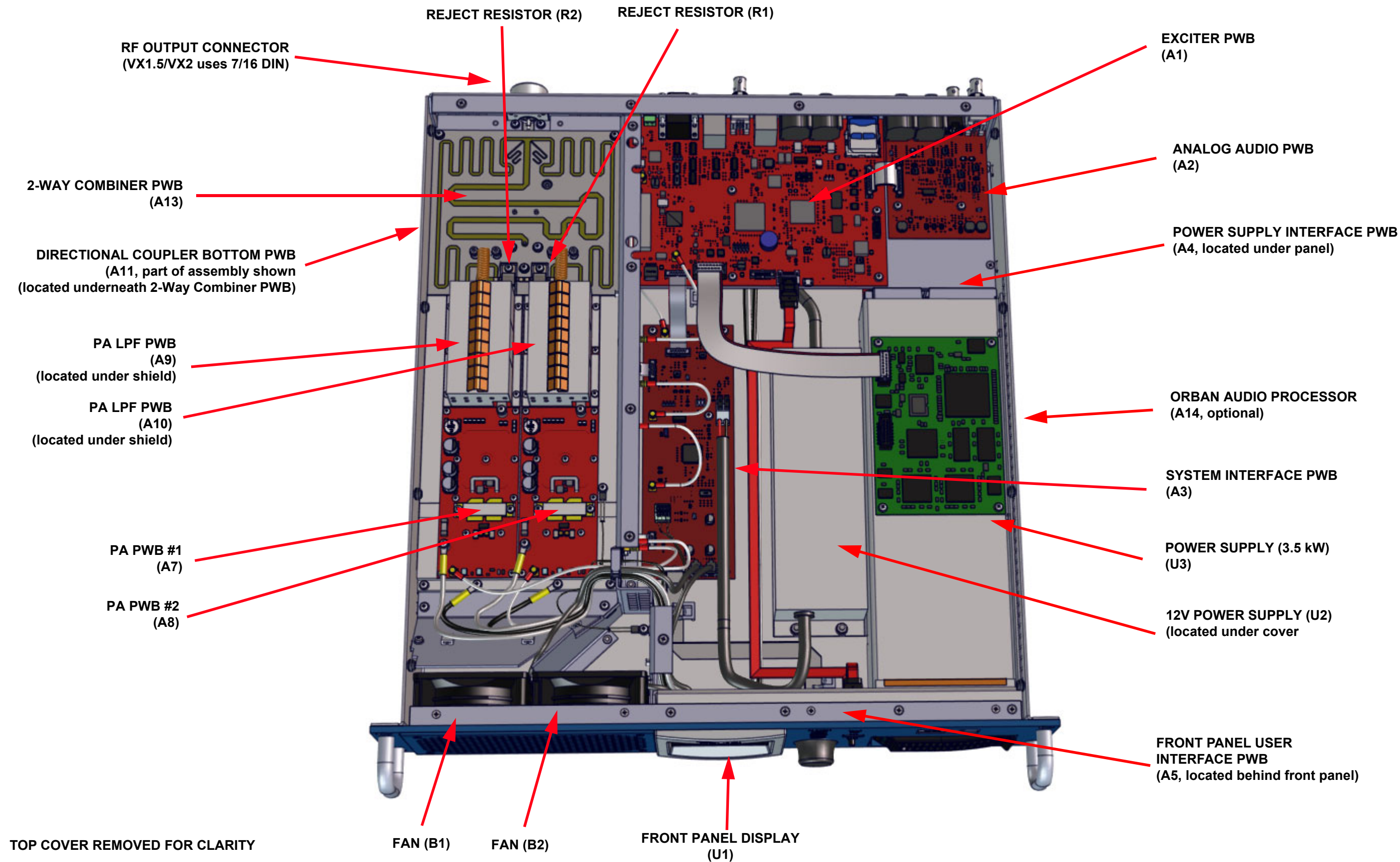
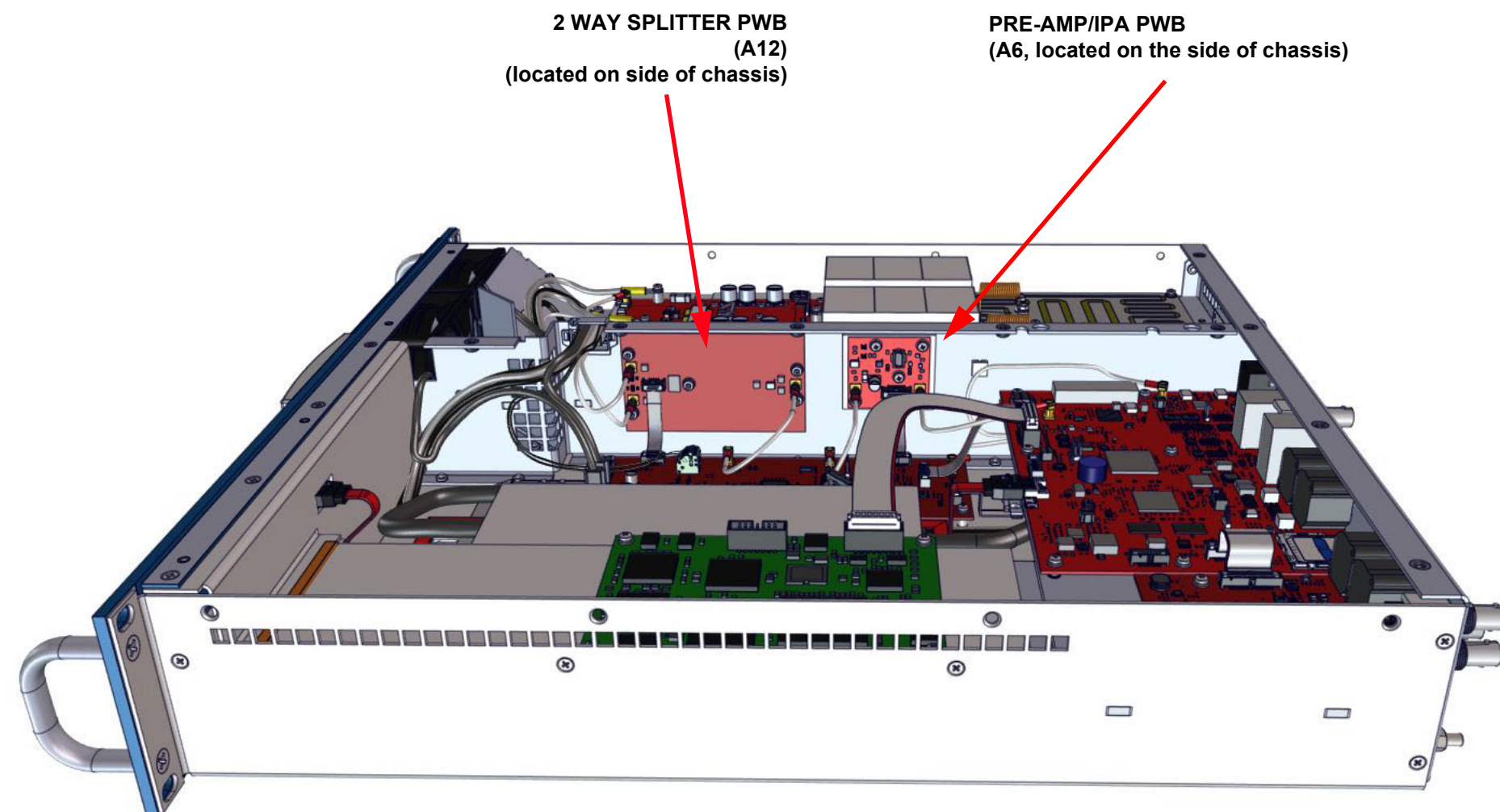
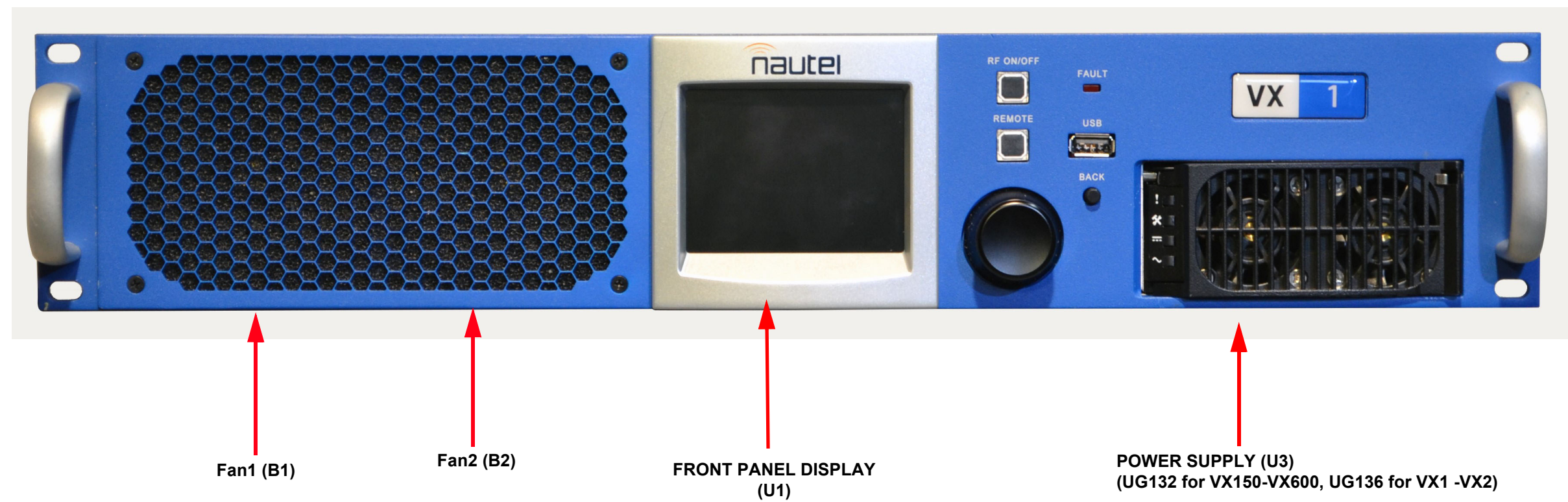


Figure MD-3: VX1.5/VX2 Transmitter (top view)



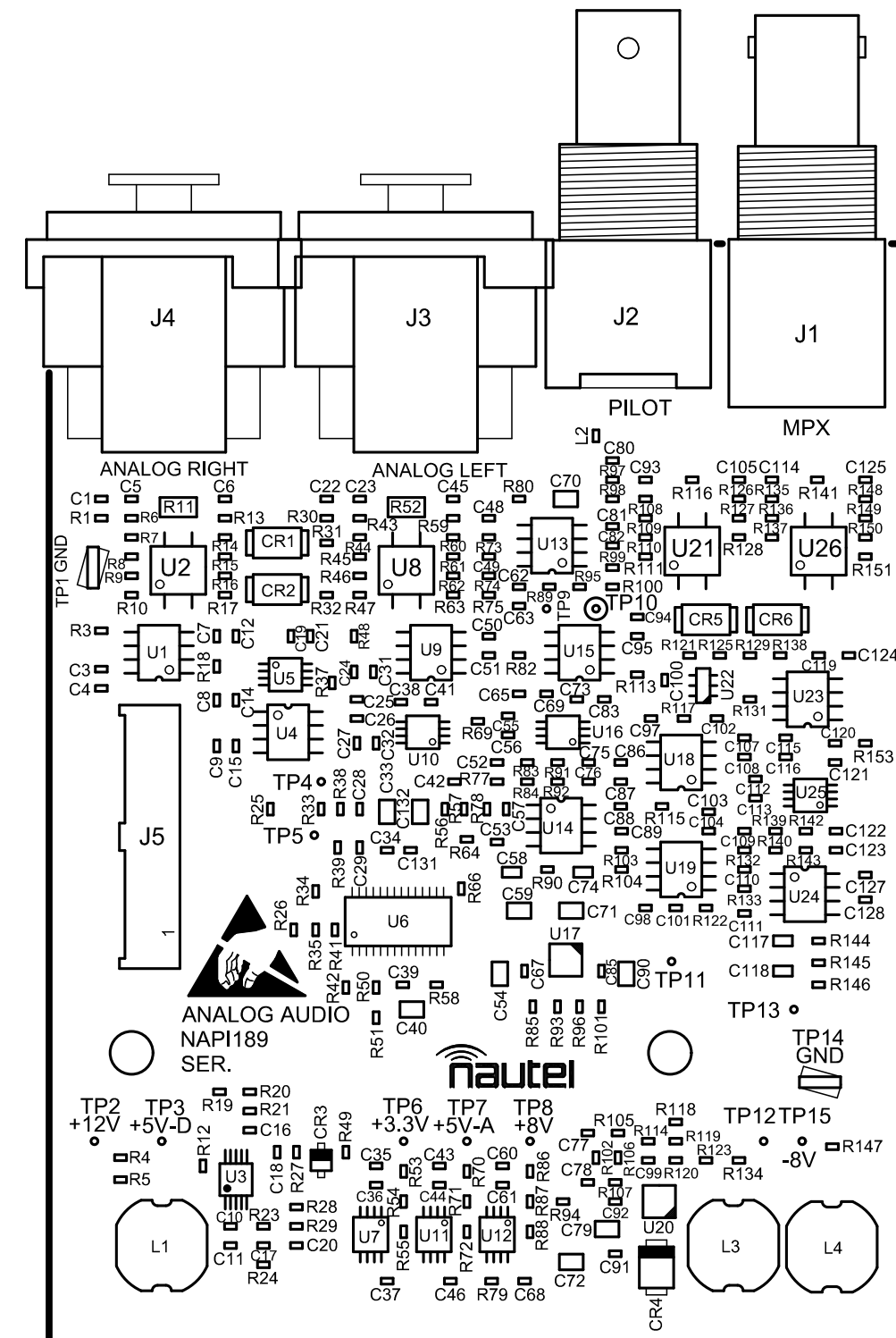
TOP COVER REMOVED FOR CLARITY

Figure MD-4: VX1.5/VX2 Transmitter (side view)



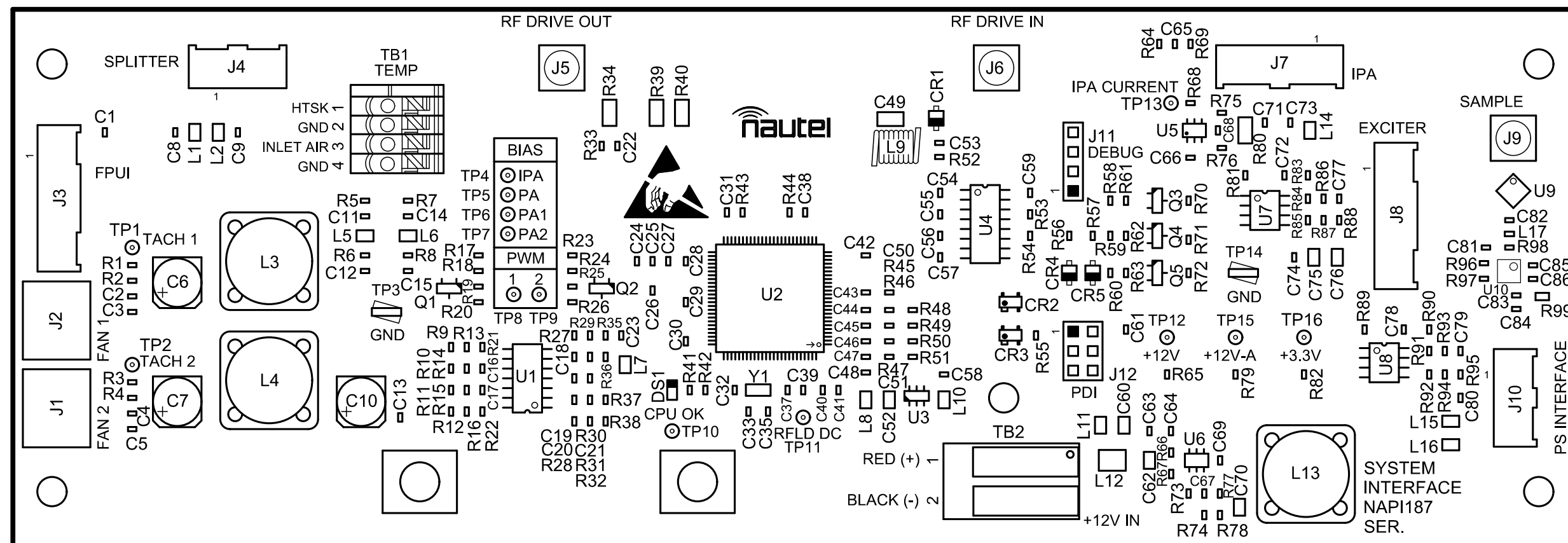
VX1 Shown for reference

Figure MD-5: VX Transmitter (front view)



235-3020-MCH01 Iss. B

Figure MD-6: NAPI189 Analog Audio PWB



235-4030-01-MCH01 Iss. A

Figure MD-7: NAPI187A System Interface PWB

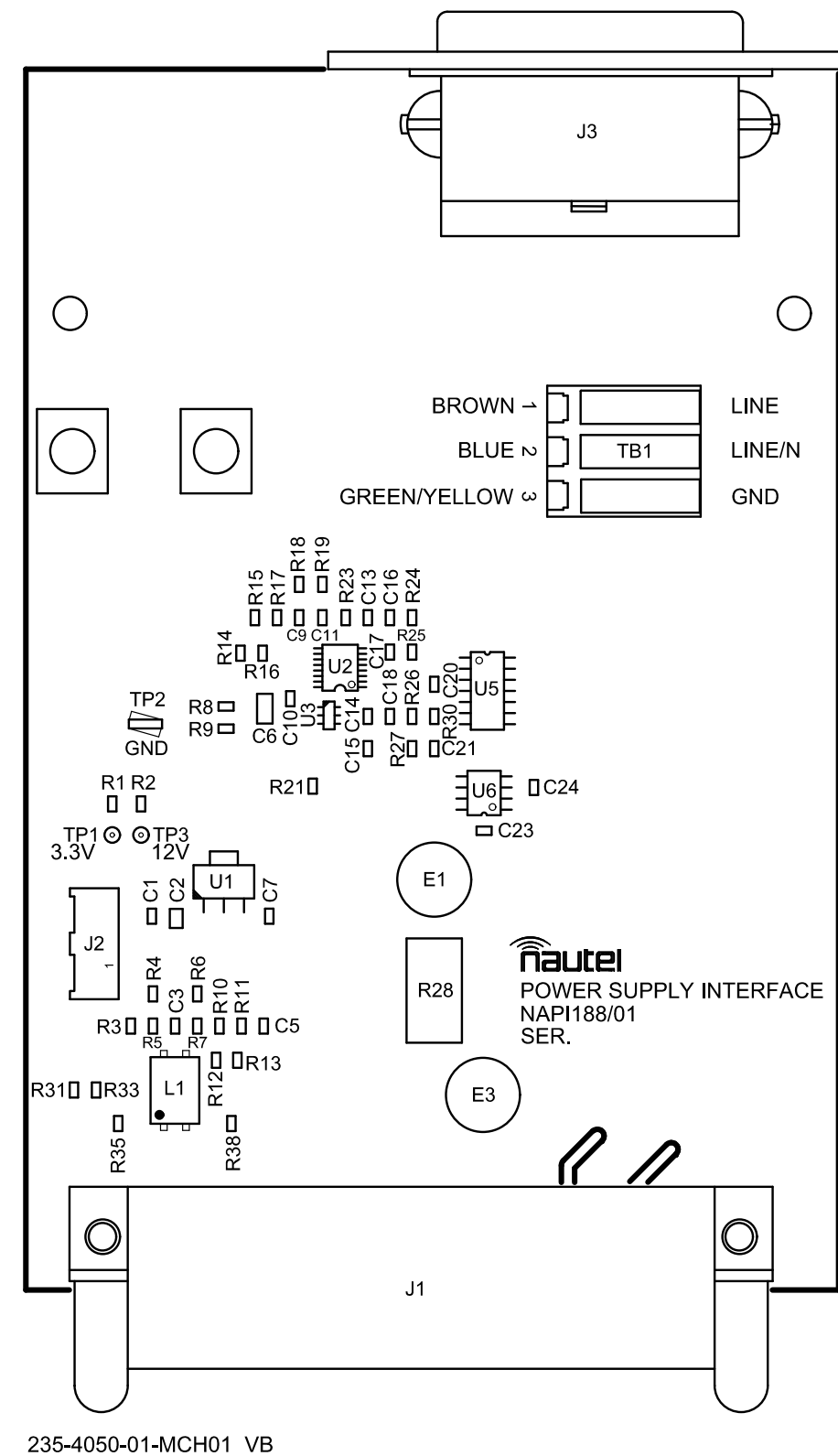


Figure MD-8: NAPI188/01 Power Supply Interface PWB (VX150/VX300/VX600)

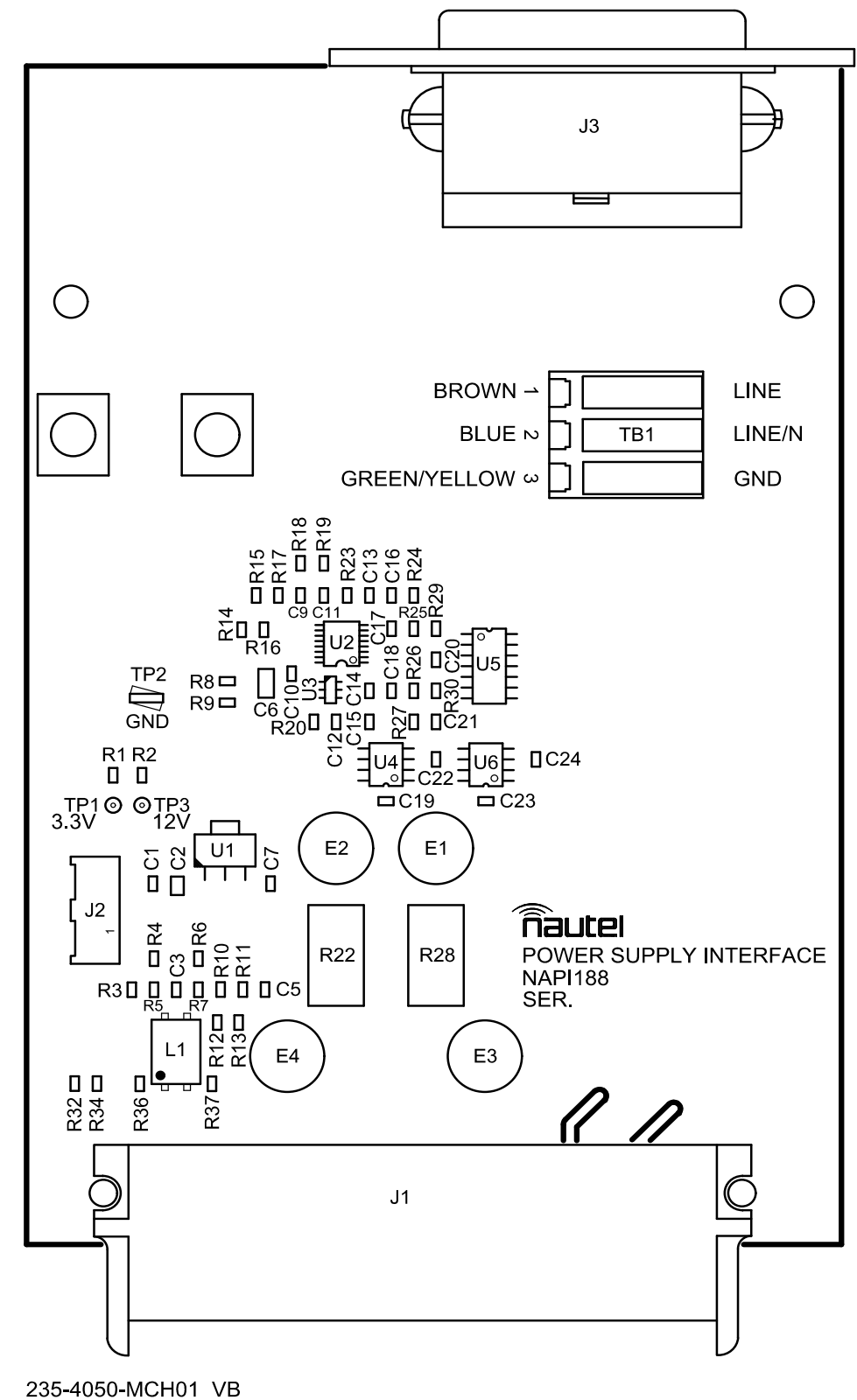
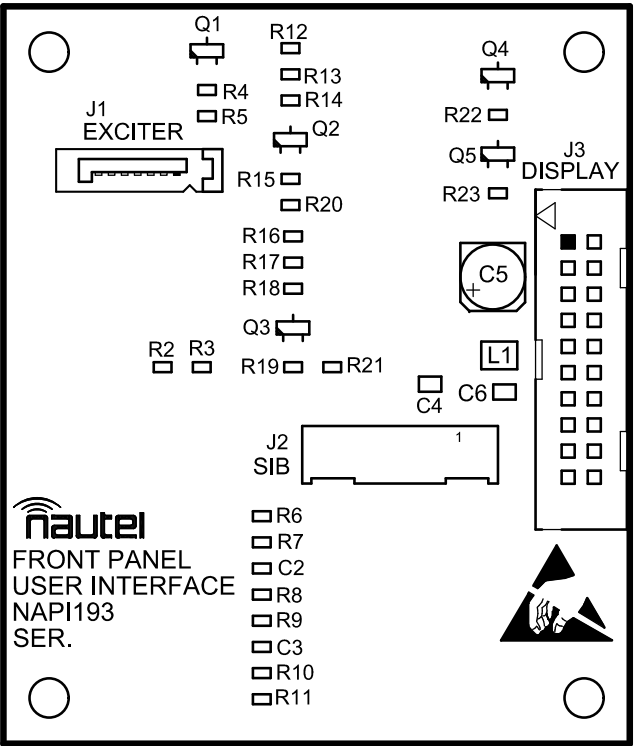
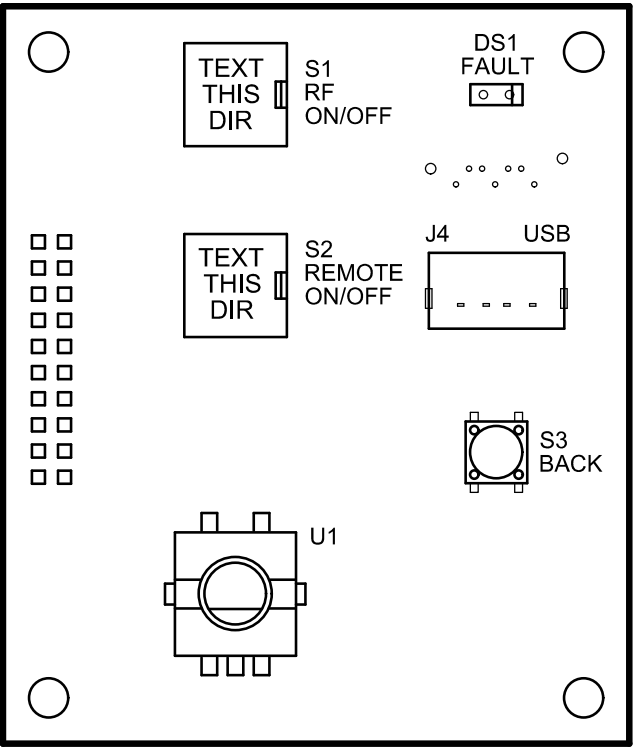


Figure MD-9: NAPI188 Power Supply Interface PWB (VX1/VX1.5/VX2)



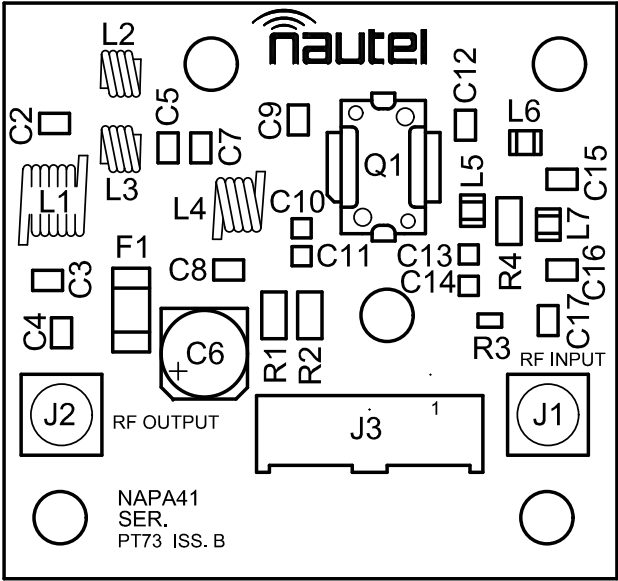
TOP SIDE



UNDERSIDE

235-4032-MCH01 VA

Figure MD-10: NAPI193 Front Panel User Interface PWB



235-1150-MCH01 VA

Figure MD-11: NAPA41 Pre-Amp/PA PWB

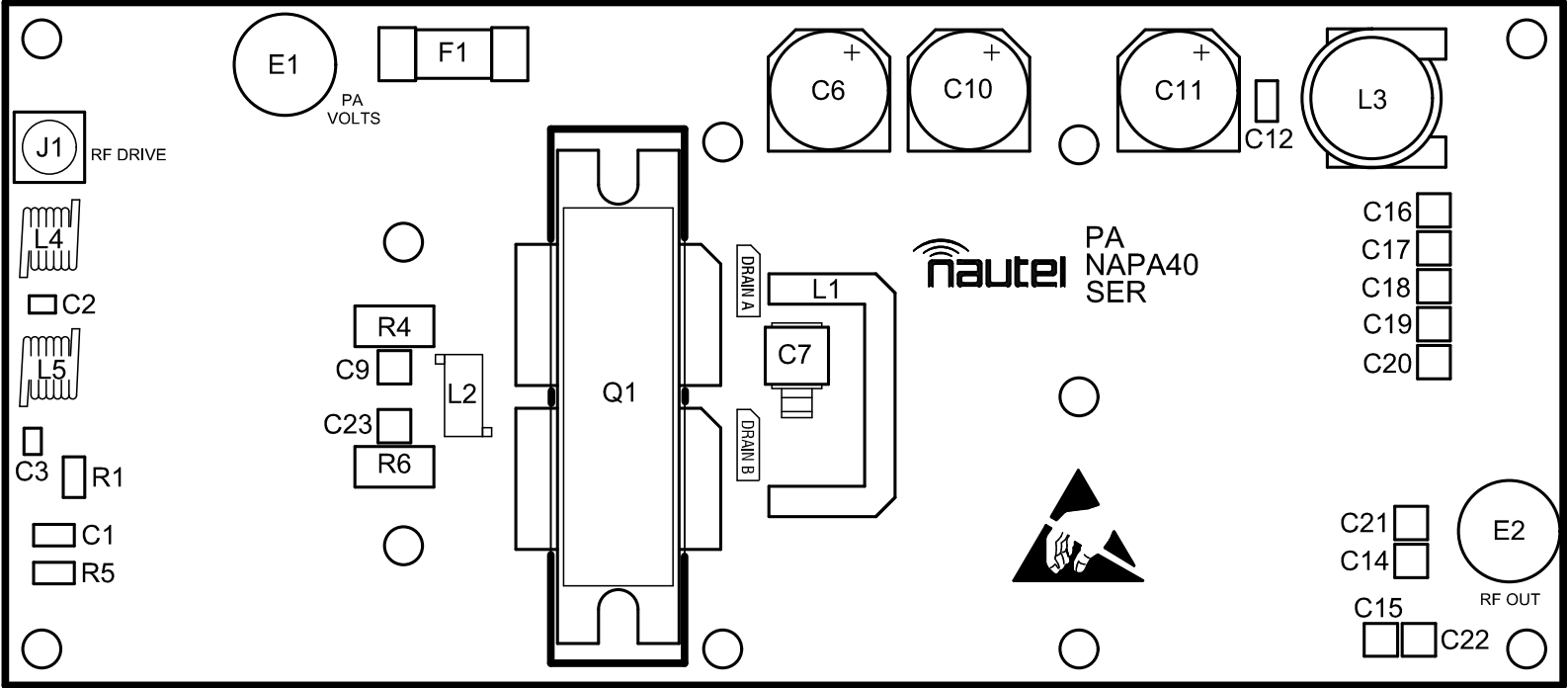
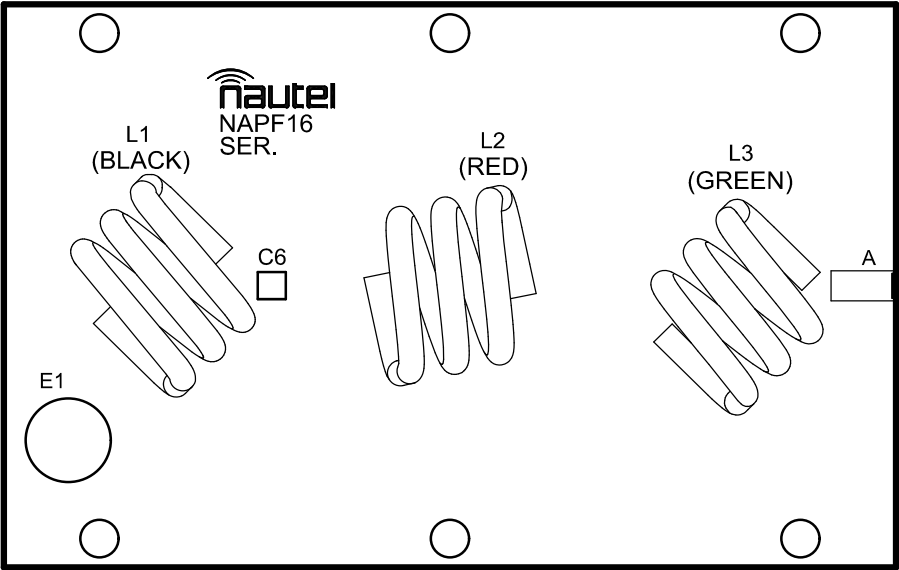
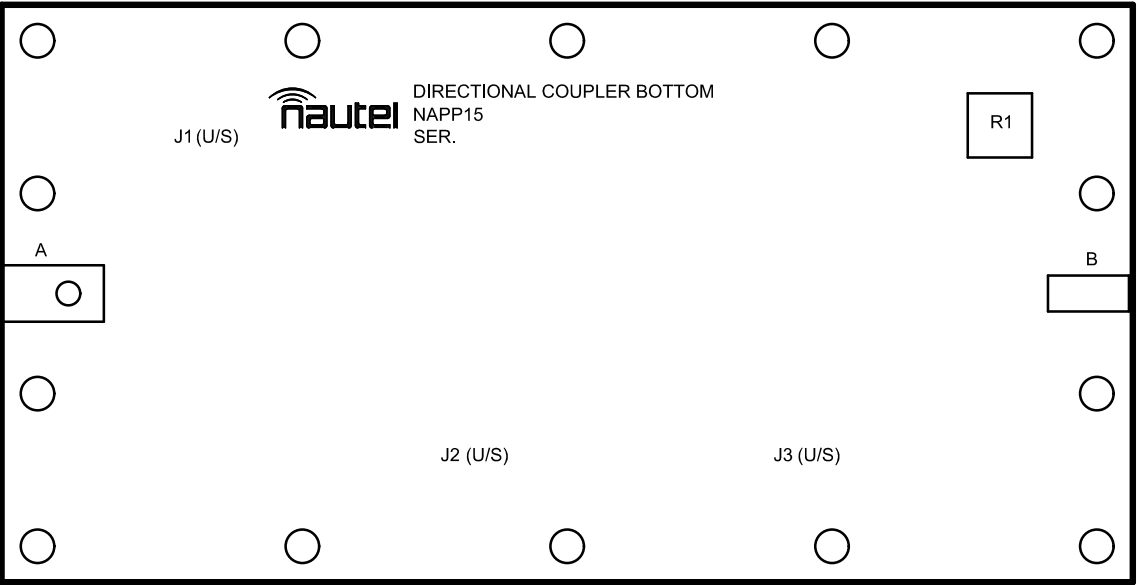


Figure MD-12: NAPA40A Power Amplifier PWB

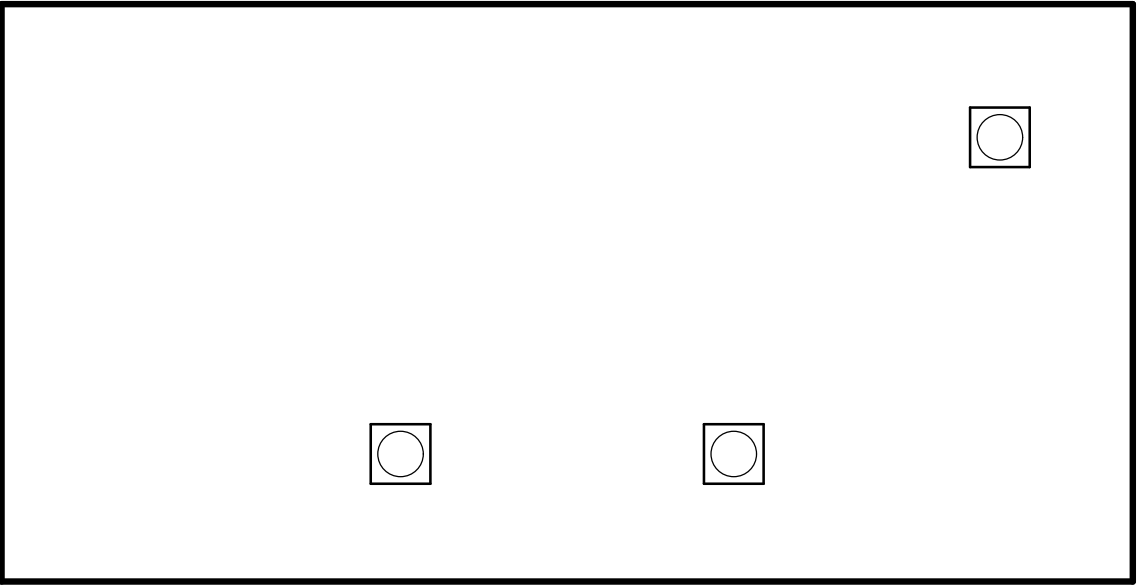


235-6020-01-MCH01 Iss. A

Figure MD-13: NAPF16A Low Pass Filter PWB



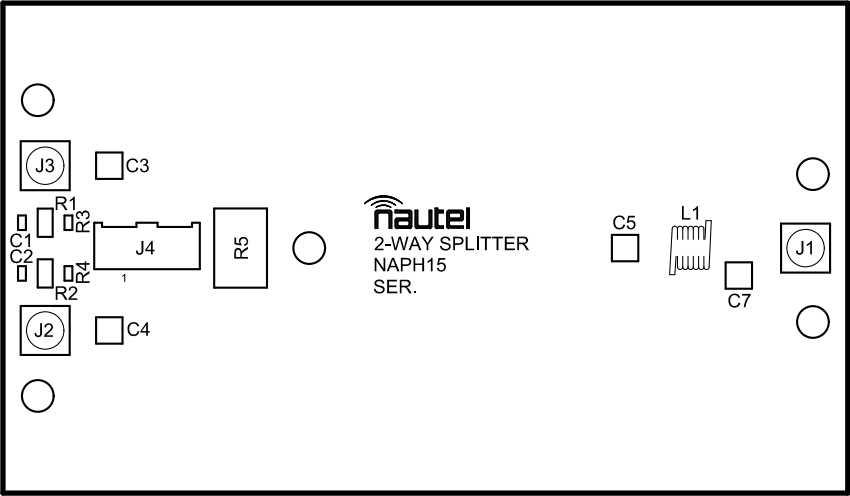
TOPSIDE



UNDERSIDE

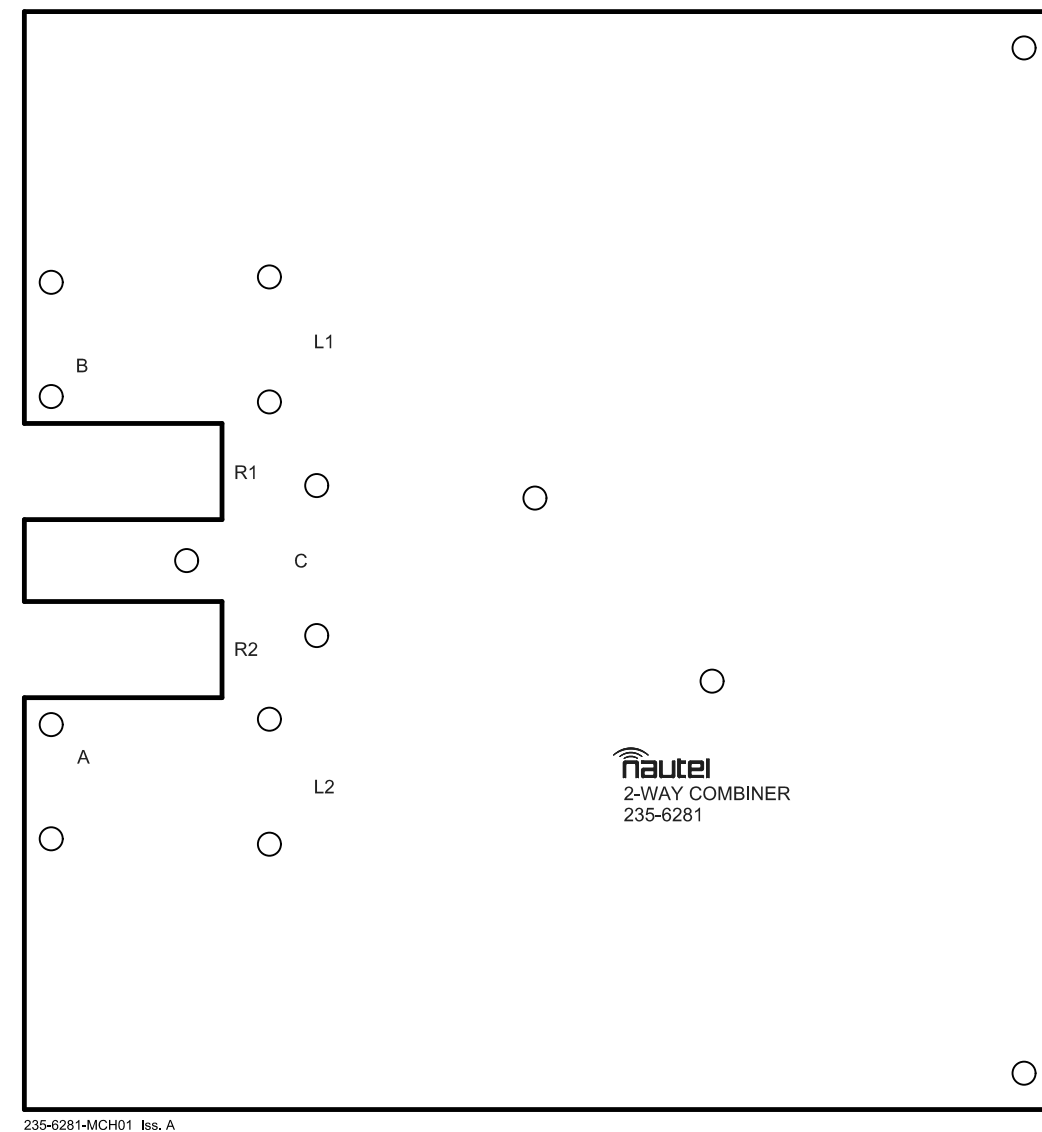
235-6250-01-MCH01 Iss. A

Figure MD-14: NAPP15A Directional Coupler Bottom PWB



235-6270-MCH01 Iss. A

Figure MD-15: NAPH15 2-Way Splitter PWB (VX1.5/VX2)



235-6281-MCH01 Iss. A

Figure MD-16: 2-Way Combiner PWB (Nautel Part # PU03B) (VX1.5/VX2)

SECTION 3.6: LIST OF TERMS

This section defines some of the terms that are used in Nautel documentation.

AES/EBU. Audio Engineering Society/European Broadcasting Union (AES/EBU) is the name of a digital audio transfer standard. The AES/EBU digital interface is usually implemented using 3-pin XLR connectors (the same type connector used in professional micros). One cable carries both left-channel and right-channel audio data to the receiving device.

CUTBACK. A reduction in RF output power, caused by the occurrence of multiple shutbacks within a pre-defined period.

DHCP. Dynamic Host Carrier Protocol.

DSP. Digital Signal Processing.

EEPROM. Electrically Erasable Programmable Read-Only Memory.

FOLDBACK. A reduction in RF output power, caused by adverse load conditions (high VSWR). No shutbacks or cutbacks have occurred.

FPUI. The Front Panel User Interface is the transmitter's front panel display that allows for extensive local control and monitoring of the transmitter.

LED. Light Emitting Diode (also referred to as lamp).

LVPS. Low Voltage Power Supply. A module or modules used in the ac-dc power stage that generates the low level dc supply voltage for the transmitter.

PRESET. A setting that controls power level, frequency and audio parameters. The VX150 to VX2 allows you to pre-program multiple presets.

PWB. Printed Wiring Board.

REMOTE AUI. The Remote AUI allows for extensive remote control and monitoring of the transmitter.

SHUTBACK. A complete, but temporary loss of RF output power, caused by any one of a variety of faults, including high VSWR.

SHUTDOWN. A complete and permanent loss of RF output power. Typically follows repeated cutback, foldback or shutback events.

SURGE PROTECTION PANEL. An electrical panel that protects equipment from electrical surges in the ac power supply, antenna or site ground caused by lightning strikes.

VSWR. Voltage standing wave ratio. This is an expression of the ratio of reverse voltage to forward voltage on the feedline and antenna system. An ideal VSWR of 1:1 provides maximum transmitter-antenna efficiency.

VX150 TO VX2 TROUBLESHOOTING MANUAL

Document: NHB-VX150-VX2-TRB

Issue: 2023-04-20

Nautel Limited

10089 Peggy's Cove Road
Hackett's Cove, NS Canada B3Z 3J4

Toll Free: +1.877.6NAUTEL (662.8835)
(Canada & USA only) or

Phone: +1.902.823.3900 or

Fax: +1.902.823.3183

Nautel Inc.

201 Target Industrial Circle
Bangor, Maine USA 04401

Phone: +1.207.947.8200

Fax: +1.207.947.3693

Customer Service (24-hour support)

+1.877.628.8353 (Canada & USA only)

+1.902.823.5100 (International)

Email: support@nautel.com

Web: www.nautel.com

© Copyright 2022 NAUTEL. All rights reserved.

