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Contacting Tecmag

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3. Connect the DAC-18 boards to their respective gradient amplifier inputs using short cables. BNC or Twin-ax connectors for these cables are supplied if ordered. If the B_0 compensation unit is included, a 3-to-1 adapter cable is provided to connect the 3 DAC outputs to the B_0 amplifier input.
4. Once the system has been tested, you may wish to mount the individual DAC-18 boards directly inside the respective gradient amplifiers, using the +/- 15V from the amplifier power supply to power them. This should significantly reduce any mains-frequency signal pickup by reducing ground loops.

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Additional Documentation

Other than the documentation in this folder (i.e. Installation Notes, last minute documentation changes, etc.), all documentation is online in either Adobe Acrobat format or in Microsoft HTML Help File format. The Adobe Acrobat Reader software package is pre-installed on the computer at Tecmag. HTML Help requires either Internet Explorer 4.01 or later, or the Microsoft HTML Help update (pre-installed on the computer at Tecmag).

The online documentation consists of:

- NTNMR Reference Manual
- NTNMR Online Help
- Hardware Reference Manual

Other items contained on the NTNMR CD include NTNMR File Format documentation, Visual Basic and Visual C++ automation examples.

ADC Board Connections

The ADC board is equipped two ADCs, labeled 'A' and 'B'. Connect the audio outputs from your demodulator to these connections.

ADC Board Specifications	
<i>systems shipped prior to 1/99:</i>	
Input Range	+/- 5v
Input Impedance	5000 ohms
<i>systems shipped after 1/99:</i>	
Input Range	+/- 2.5v
Input Capacitance	17 pF between conversions 5 pF during conversions

PTS Interface Connections

Orion systems are equipped to control two PTS synthesizers as a standard feature.*

1. Connect the single end of the provided PTS control (DB25 on one end, two DB25s on the other) cable to the Event Module labeled 'PTS' (*note that the label may vary*).
2. Connect one PTS adapter to each PTS to be controlled.
3. NTNMR is configured by default so that F1 in the dashboard controls PTS 1 and F2 in the dashboard controls PTS 2. Consult the Hardware Reference manual for details on changing the frequency control settings in NTNMR and for adding custom mixing schemes to the frequency calculations.

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Optional Gradient Subsystem Installation Procedure.

1. Find a convenient location near the gradient amplifiers for the DAC-18 subsystem box.
2. Connect the subsystem to the console using three RJ-45 serial cables. Note that the outputs of the gradient board in the console are X, Y, and Z in order from bottom to top. One serial cable goes to each channel. If you have ordered a B_0 compensation unit, you will need to install 3 additional cables for the X, Y, and Z components.

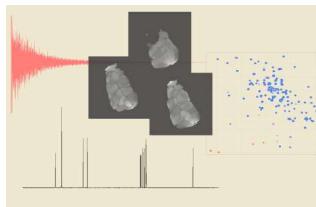
Back panel connectors include:

- **Event Module outputs.** DB25 connectors for the TTL level pulse programmer lines. One Event Module DB25 may be used for PTS control.
- **ADC inputs.** BNC connectors for input of the demodulated NMR signal in quadrature (channels 'A' and 'B').
- **10 MHz in/out.** 1 V p-p 10 MHz sine wave is available for synchronizing external devices (if required).
- **Ext Trig in.** Apply a TTL (5v) pulse here to synchronize pulse sequences with external events (as required).

Pulse Programmer Output Connections

The following diagram shows the output map for the pulse programmer lines on the Event Modules. Consult the Hardware Reference manual ('Accessing the User Definable Pulse Programmer Lines') for information about assigning output lines to pulse sequence lines. The output lines are equipped with 25 ohm line drivers.

DB25 Pin Number	Output Line Assignment
01	0
02	1
03	2
04	3
05	4
06	5
07	6
08	7
09	8
10	9
11	10
12	11
13	12
14	13
15	14
16	15
17	16
18	17
19	18
20	19
21	20
22	21
23	22
24	23
25	GND



Orion Installation

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Introduction

Verify that the shipment is complete. See **Parts Lists**, below, and any shipping documents. Check for any notices or instructions attached to the units.

Parts List *

- Orion console, including AC power cable and extra connectors
- PCI interface cables (two 50-pin, 6 ft ribbon cables)
- NTNMR software CD-ROM (required only for backup, re-installation, or installation on another computer)
- Computer system, including tower, power cord, keyboard, mouse, Tecmag PCI interface boards (factory-installed) and software (factory-installed).
DISPLAY MONITOR NOT INCLUDED.

Optional Parts List *

- DAC-18 subsystem chassis, with serial data cables (RJ-45 connectors, 25 ft, similar to 10-base-T network cables).
- PTS interface adapters

* Note: Consult packing list for exact list of items in your shipment

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Installation Procedure

Note: NTNMR is pre-installed on the spectrometer computer at the factory - you do not need to run the NTNMR Installer from the CD! The NTNMR CD contains additional material as well as an installer for re-installing NTNMR if necessary.

The Orion data acquisition systems consists of a pulse programmer with up to 224 control lines (TTL level outputs), a digitizer (12 bit, 1 MHz or 16 bit, 500 kHz), and a signal averager. PTS control and shape modules for gradient control are optional.

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Additional Documentation

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The online documentation consists of:

- NTNMR Reference Manual
- NTNMR Online Help
- Hardware Reference Manual

Other items contained on the NTNMR CD include NTNMR File Format documentation, Visual Basic and Visual C++ automation examples.

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7. Power up the console, computer, and DSpect (optional Gradient control unit if applicable). Start NTNMR and note any error messages at startup. The DSpect is configured to receive its 10 Mhz clock from the console (via connector A1). The console must be powered for the DSpect to respond properly.
8. The lock display signal can use the original Bruker monitor, or be captured by a video card and displayed within a window as part of NTNMR. In either case, it may be necessary to remove the two I/O BUS cables located between the PTS and the video control unit in the right-side cabinet (AC and AF only). No other cabling changes are required to view the lock signal with the original Bruker monitor. Use the supplied circular burndy style connector to route the video output thru the NTSC converter for capture on the PC.
9. Begin testing the spectrometer operation. The NTNMR SDC panel controls for LED displays on the Bruker console is a good starting point. Then use one of the included data files for one-pulse H1 acquisition to acquire an NMR signal. After testing is completed, you may permanently replace the Aspect 3000 computer. Disconnect all remaining cables to the Aspect 3000. Remove the Aspect 3000 from the carriage (AC & AF only). Place the DSpect on the carriage (AC & AF only) and push the DSpect into the console. At this time other Aspect 3000 peripherals such as disk drives can be removed from the console if desired.

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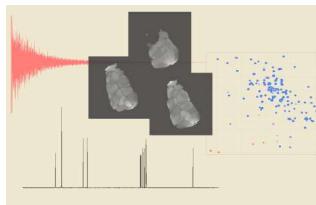
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Installation

1. Power-down the console by switching off the main circuit breaker.
2. Temporarily place the DSPect close to the back of the Aspect 3000. Disconnect the following cables from the Aspect:
 - P2 - Burndy connector
 - I3 - Burndy connector (if present)
 - P1 - Burndy connector
 - A1 - Burndy connector
 - Slow Dev Ch - 25DB
3. Connect the cables in step #2 to the DSPect. Connect one of the free power cords (220V) to the DSPect. If possible, power the computer from the console 220V also (verify AC selector is set for 220V).
4. Install the two 50-pin Interface cables from the computer PCI cards to their corresponding inputs on the DSPect; the PCI-SA and PCI-SI. The NTNMR software package is pre-loaded at the factory.
5. SCM controller:

Connect the SCM cable provided with the DSPect to the 9-pin serial port on the PC (#2 on the computer) and to the 25-pin port labeled "Aspect" under the keyboard.
6. SEU Imaging (optional accessory)
 - a. For systems with the SEU imaging accessory, a SEU adapter is provided. Disconnect the Burndy-type connector entering the SEU board and insert the adapter. Reconnect the input onto the adapter. Three BNC inputs on the adapter take two signals from the Gradient control unit and the third input from the DSPect BNC labeled "H/S" (hard/soft). Three 8 ft BNC cables are provided.
 - b. To connect the 5 inputs for the Gradient Control unit to the DSPect, 5 RJ-45 network-type cables are provided. Connect 3 to the SM-Grad and two to the SM-RF boards on the DSPect. Two BNC RF modulation outputs go to the SEU adapter as described above. The three gradient outputs go directly to the NAD amplifiers by means of the provided BNC-to-RCA cables.



DSpect Installation

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Introduction

Before starting the installation it is strongly recommended that you record the following information:

- All Shim values from the SCM
- Base and offset frequencies for all observe nuclei and for the decoupler
- Printouts of samples on hand for each observe nucleus
- Offset values for each lock solvent used

Note: NTNMR is pre-installed on the spectrometer computer at the factory - you do not need to run the NTNMR Installer from the CD! The NTNMR CD contains additional material as well as an installer for re-installing NTNMR if necessary.

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Parts List

- Computer, keyboard, mouse, PCI interface cards (pre-installed), monitor not included
- DSpect
- SCM cable (1- DB25 to DB9, 10 ft)
- PCI interface cable (2- 50-pin ribbon, 6 ft)
- NTNMR CD
- Lock display adapter (cabling: from Burndy on Bruker video unit via CGA-to NTSC converter box to RCA jack video-in on computer PCI video capture card)

Optional Accessories

- Gradient Control unit
- SEU adapter
- RJ-45 network cable (5- 30 ft each)
- Gradient amp input cable (3- 3 ft each)
- BNC cable (3- 8 ft each)

Figure 1: 8U Back Panel Layout^{*}

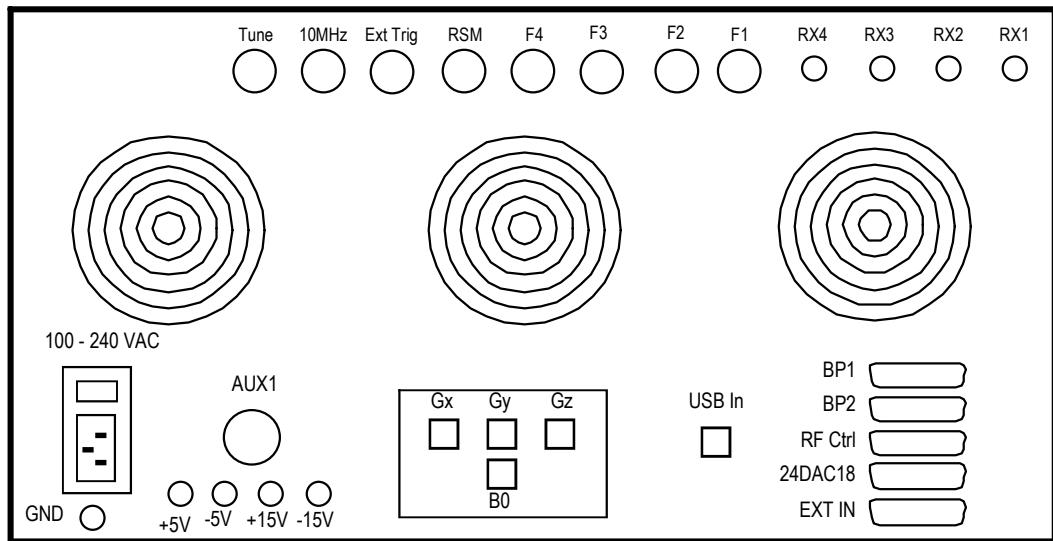
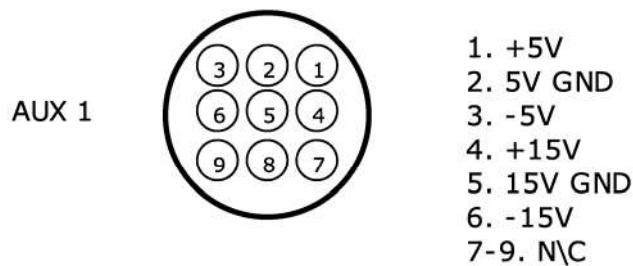


Figure 2: DC Power Pin Outs—Redstone 8U



^{*} Actual system layout may differ from drawing. Consult printed installation documentation received with the system.

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Additional Documentation

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The online documentation consists of:

- TNMR Reference Manual
- Hardware Reference Manual
- System Specific documentation

Other items contained on the TNMR CD include TNMR File Format documentation, Visual Basic and Visual C++ automation examples.

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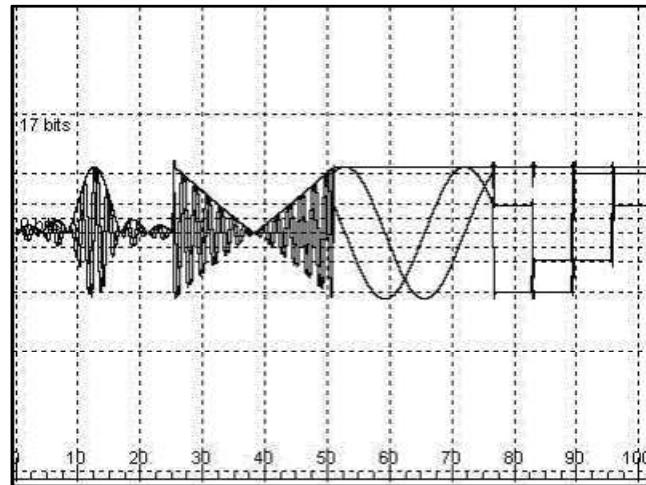
Preliminary Test - Loopback

Disconnect **F1** TX output and **RX1** input from the console. Connect **F1** to **RX1** via a 50 ohm coaxial cable and a 20dB attenuator.

Turn on the power. The red LED on the front panel should light up. Turn on and boot up the computer.

Double-click the TNMR icon on the desktop. TNMR will start, and after a brief delay a “beep” will sound signifying that the console has been initialized.

Open the file \Data\Test\Loopbacks\Loopback_F1.tnt. Click the “ZG” button on the toolbar. A waveform should appear on the screen consisting of a sinc and “bow-tie” amplitude modulation function followed by discrete and continuous phase modulation.



If this test fails, contact Tecmag technical support immediately.

If this test passes, reconnect the cables to **F1** and **RX1**. You’re ready to go!

- **BP1, BP2, etc. outputs.** DB25 to BNC pigtail adapters are provided for convenient access to the pre-assigned output signals for blanking of RF power amplifiers and/or triggering external devices (such as an oscilloscope). Connect the adapters and connect the appropriate BNC outputs to the amplifier(s), scope, etc. Observe the labeling on the BNC connectors as the lines have been pre-assigned for specific functions.
- **EXT IN inputs.** DB25 connector for conditional branching. Pins 1-4 (bits 0-3) may be connected to external devices to receive a TTL level input signal which can be tested by the pulse sequence for conditional branch logic determination. Pin 25 is ground.

Additional TTL level lines appear on the provided DB25 connectors that may be used to control external devices. For use of spare LP lines, refer to TNMR documentation and consult the chart included for output assignments, or contact technical support. Note that Tecmag reserves the right to assign any one or more of these lines to specific purposes in future hardware/software releases.

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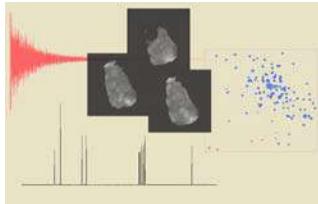
Optional Gradient Subsystem Installation Procedure.

1. Find a convenient location near the gradient amplifiers for the DAC-20 subsystem box.
2. Connect the subsystem to the console using three RJ-45 serial cables. Note that the outputs of the gradient board in the console are X, Y, and Z in order from bottom to top. One serial cable goes to each channel. If you have ordered a B_0 compensation unit, you will need to install an additional cable.
3. Connect the DAC-20 boards to their respective gradient amplifier inputs using short cables. BNC or Twin-ax connectors for these cables are supplied if ordered. If the B_0 compensation is included, connect the B_0 DAC output to the B_0 amplifier input.
4. Once the system has been tested, you may wish to mount the individual DAC-20 boards directly inside the respective gradient amplifiers, using the +/- 15V from the amplifier power supply to power them. This should significantly reduce any mains-frequency signal pickup by reducing ground loops.

Hardware installation

All connections are on the rear of the Redstone console cabinet.

1. **General Setup:** Find a convenient location for the Redstone chassis and the computer. Be sure to leave the air vents on the consoles (front and back) unobstructed.
2. **AC Power:** Check that the power switch is off (lower left of rear panel). Connect AC mains power of proper voltage to the rear panel AC socket.
NOTE: The power supply is autoswitching between 100 and 240 VAC.
3. **Redstone/Computer Interface Connections:** Using the provided labeled USB cable, connect Redstone (USB IN) to a free USB port on computer. Once the power of Redstone is on, check the Device Manager to verify the computer load the USB drivers. Look for Tecmag NMR Interface (SA-USB) with Firmware (tecsa.sys) and Tecmag NMR Interface (SI-III) with Firmware (tecsi3.sys) drivers. The actual number of drivers loaded will depend on the system configuration.
 - If “Found new hardware” wizard appears, chose “No, not at this time.” when asked if Windows may connect to Windows Update. Click “Next”
 - Choose “Install the software automatically (Recommended)” and click “Next”
 - Choose “Continue Anyway” at the Logo verification disclaimer.
4. **Transmitter/Receiver/Blanking Connections:** Connect the following signals to the appropriate points in the NMR system using 50 ohm coaxial cable and BNC connectors (not supplied):
 - **F1-F4.** Approximately 1 V_{PP} modulated radiofrequency (RF) source for the F1 transmitter channel. Connect to the input of your RF amplifier. Use a fixed attenuator if required (not supplied).
 - **RX1 - RX4.** Low-level RF signal from your RF preamplifier. A preamp with a gain of 20-30dB is recommended, depending on the application. The internal amplifier has a gain of about 70dB, and the input may be damaged by excessive signal.
 - **10 MHz out.** >1 V_{PP} 10 MHz sine wave is available for synchronizing external devices (if required).
 - **Ext Trig in.** Apply a TTL (5V) pulse here to synchronize pulse sequences with external events (as required).



Redstone Installation

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Introduction

Verify that the shipment is complete. See **Parts Lists**, below, and any shipping documents. Check for any notices or instructions attached to the units.

Parts List *

- Redstone 8U Console Chassis
- USB interface cable to PC
- DB25 to BNC pigtail adapters
- TNMR software CD-ROM

* Note: Consult packing list for exact list of items in your shipment

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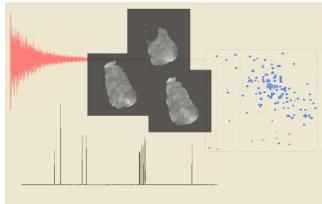
Installation Procedure

Note: if TNMR is pre-installed on the spectrometer computer at the factory - you do not need to run the TNMR Installer from the CD! Skip the TNMR Installation Procedure! The TNMR CD contains additional material as well as an installer for re-installing TNMR if necessary.

However, if TNMR is not pre-installed on the spectrometer computer, please follow the TNMR Installation.

TNMR Installation

1. Do not connect the Redstone USB cables to the computer. Turn on the computer and insert the TNMR CD.
2. An TNMR InstallShield Wizard window is opened automatically. If not, go to the CD main directory; double click on the file, “Setup.exe”.
3. TNMR requires Adobe Acrobat Reader to view on-line reference manuals. If your PC requires Adobe Acrobat Reader, choose the “Custom” install option and add Adobe Acrobat Reader. Otherwise, simply use the “Default” installation.
4. Follow the steps provided in the TNMR InstallShield Wizard to finish the installation
5. Restart the computer.



Installation Guides

Click on the Installation Guide Below:

[Redstone](#)

[DSPect](#)

[Orion](#)