

Control Interface Description Document for the Nuvo NV-T2

Revision A
February 18, 2005

DB9M PORT PINOUTS

Nuvo Transmit to NV-T2 on pin 2. Receive from NV-T2 on pin 3. Ground on pin 5.

SERIAL PORT PARAMETERS

RS232, No Flow Control (RTS/CTS or software NOT required), 9600 baud, 8N1 protocol.

RULES OF PROTOCOL

- (1) For alpha ASCII characters, upper case and lower case can be used interchangeably. In this document, upper case is used and actual characters in a string are presented in **BOLD** type.
- (2) All numerical fields are coded as ASCII digit characters.
- (3) Each Command string is STARTED with an ASCII "*" character and terminated by a <CR> character (0D hexadecimal). Each response string issued by the Tuner will START with an ASCII "#" and be terminated with a <CR> character (0D hexadecimal). Note: the <CR> will NOT be shown in the examples.
- (4) If a command has an error in it (does not adhere to exact command syntax, the Concerto will respond with "#T'x'?<CR>". No response will be generated if the command is not recognized at all. (i.e. "*XYZ<CR>" and "*T'C'XYZ<CR>" will get no response while "*T'A'XYZ<CR>" will get an error response.
- (5) Whenever queuing multiple commands to the Tuner, the host program should pause for 50 milliseconds between commands to prevent buffer overruns.

RESPONSES

Most serial commands DO NOT have a dedicated acknowledge response. Most commands change the state of the tuner and the automatic unsolicited status indicators indicate the action performed.

NUVO POWER ON STATE

The Power-On state of each tuner can be controlled through the "Adv. Settings->Auto-On" menu.

UNSOLICITED STATUS INDICATORS

Whenever the status of the tuner changed, a serial status string is sent indicating the new state of the tuner. It does not matter what caused the state change (front panel buttons, Concerto DisplayPads, serial commands, radio information, etc.) These indicators will allow an external controller to stay in sync with the tuner. All tuner responses and status indicators begin with #T' x' (x is either A or B indicating either Tuner-A or Tuner-B).

OFF – Tuner Off Status

Syntax: #T' t' OFF

Parameters: t A, B: Tuner ID

This indicator is sent when the tuner is turned off.

ON – Tuner On Status

Syntax: #T' t' ON, FM103.5 or
#T' t' ON, AM700 or
#T' t' ON, WX1 or
#T' t' ON, AUX

Parameters: t A, B: Tuner ID

This indicator is sent when the tuner is turned on or if the source, band, or frequency changes. For FM frequencies, the frequency is displayed either as **xx.x** or **1xx.x** (i.e. 98.5 or 103.5) unless fine-tuning is enabled or the current frequency ends with .05 (i.e. 101.15) where one additional digit is added to the end. For AM frequencies, the frequency is displayed either as **xxx** or **1xxx** (i.e. 550 or 1530). For weather channels, the channel is displayed as a single digit (1 to 7).

PRESET – Tuner Is Tuned to a Preset (Version 1.07 and higher)

Syntax: #T' t' PRESET nn, "xyz"

Parameters: t A, B: Tuner ID
nn Preset Number
First digit is preset bank (0-9)
Second digit is preset number in band (0-9)
xyz Preset Description

This indicator is sent when the tuner is tuned to a frequency that corresponds to a preset. It does not necessarily mean the a preset button was used; manually tuning to the frequency will also trigger this message.

RDSRT – RDS RadioText for Current FM Station (Version 1.07 or higher)

Syntax: #T' t' RDSRT" xyz"

Parameters: t A, B: Tuner ID
xyz String containing current RDS text (64 characters maximum)

This indicator is sent when a radio station sends a new RDS RadioText string.

RDPSN – RDS Program Service Name for Current FM Station (Version 1.07 or higher)

Syntax: #T' t' RDSPSN" xyz"

Parameters: t A, B: Tuner ID
xyz String containing current RDS PSN (8 characters maximum)

This indicator is sent when a radio station sends a new RDS Program Service Name string. Note that although the RDS specification states that the PSN string should be static, some radio stations are dynamically changing this string which can cause a large number of messages.

FREQDESC –Tuner is Tuned to a Frequency With a Description (Version 1.07 or higher)

Syntax: #T' t' FREQDESC" xyz"

Parameters: t A, B: Tuner ID
xyz String containing Frequency Description (16 characters maximum)

This indicator is sent when the tuner is tuned to a frequency which has been described in the Advanced Frequency List of the Configurator Software.

PRIMARY COMMANDS

All commands must be addressed to only one of the two tuners in the NV-T2. All tuner commands begin with *T'x' (x is either A or B indicating either Tuner-A or Tuner-B). These commands are recommended for external control use because the results are deterministic. Commands in the "Other Commands" section emulate individual button pushed and are for interactive use. The results of one command depend on the commands before and after.

VER – Get Version Information

Syntax: *T't'VER

Response: #T't'VER"NV-T2 FWv1.00 HWv00"

Parameters: t A, B: Tuner ID

STATUS – Get Tuner Status

Syntax: *T't'STATUS

Parameters: t A, B: Tuner ID

The STATUS command initiates an immediate Status Indicator ON or OFF response.

ON – Turn Tuner On

Syntax: *T't'ON

Parameters: t A, B: Tuner ID

If tuner is already on, this command will have no effect.

OFF – Turn Tuner Off

Syntax: *T't'OFF

Parameters: t A, B: Tuner ID

If tuner is already on, this command will have no effect.

AM – Tune to AM Frequency

Syntax: *T' t' AMffff

Parameters: t A, B: Tuner ID
ffff 3 or 4 digit AM frequency (in kHz)

Examples: *T' A' AM550 Tunes to 550 kHz AM
*T' A' AM1361 Tunes to 1361 kHz AM

Command will tune directly to the specified frequency. Direct tuning is not limited by regional settings and can be in 1 kHz increments.

FM – Tune to FM Frequency

Syntax: *T' t' FMffffff

Parameters: t A, B: Tuner ID
ffffff FM frequency (in kHz)

Examples: *T' A' FM102.5 Tunes to 102.5 MHz FM
*T' A' AF102.55 Tunes to 102.55 MHz FM
*T' A' AF98 Tunes to 98.0 MHz FM
*T' A' AF980 Tunes to 98.0 MHz FM
*T' A' AF9800 Tunes to 98.0 MHz FM

Command will tune directly to the specified frequency. Direct tuning is not limited by regional settings and can be in 0.05 MHz increments.

WX – Tune to Weather Band

Syntax: *T' t' WXx

Parameters: t A, B: Tuner ID
x Weather Band Channel Number

1:	162.400 MHz
2:	162.425 MHz
3:	162.450 MHz
4:	162.475 MHz
5:	162.500 MHz
6:	162.525 MHz
7:	162.550 MHz

Command will tune directly to the specified channel.

AUX – Select AUX Input

Syntax: *T' t' AUX

Parameters: t A, B: Tuner ID

Selects AUX input if enabled.

PRESET – Tune to a Preset

Syntax: *T' t' PRESETnn

Parameters: t A, B: Tuner ID
nn Preset number
First digit is preset bank (0-9)
Second digit is preset number inside bank (0-9)

Examples: *T' A' PRESET04 Tunes to preset 4 on the first preset bank
*T' A' PRESET21 Tunes to preset 1 on the third preset bank

Command tunes to the specified preset on the specified bank. Preset banks start numbering with '0'. The preset numbers inside the bank correspond to the button number assigned to the preset.

TUNE+ – Tune Up One Step

Syntax: *T' t' TUNE+

Parameters: t A, B: Tuner ID

Command is equivalent to turning selector knob one click clockwise when in Step Tuning mode. If tuner is not in "Step Tuning" mode, the tuning mode will be changed.

TUNE- – Tune Down One Step

Syntax: *T' t' TUNE-

Parameters: t A, B: Tuner ID

Command is equivalent to turning selector knob one click counter-clockwise when in Step Tuning mode. If tuner is not in "Step Tuning" mode, the tuning mode will be changed.

SEEK+ – Seek Up

Syntax: *T' t' SEEK+

Parameters: t A, B: Tuner ID

Command is equivalent to turning selector knob one click clockwise when in Seek Tuning mode. If tuner is not in "Seek Tuning" mode, the tuning mode will be changed.

SEEK- – Seek Down

Syntax: *T' t' SEEK-

Parameters: t A, B: Tuner ID

Command is equivalent to turning selector knob one click counter-clockwise when in Seek Tuning mode. If tuner is not in “Seek Tuning” mode, the tuning mode will be changed.

SCAN – Scan

Syntax: *T' t' SCAN

Parameters: t A, B: Tuner ID

Command is equivalent to turning selector knob one click clockwise when in Scan Tuning mode. If tuner is not in “Scan Tuning” mode, the tuning mode will be changed.

SRCAM – Change Band to AM

Syntax: *T' t' SRCAM

Parameters: t A, B: Tuner ID

Command changes the band to AM. The frequency will be the last AM frequency used. The command is equivalent to cycling with the “Source” button until the AM band is selected.

SRCFM – Change Band to FM

Syntax: *T' t' SRCFM

Parameters: t A, B: Tuner ID

Command changes the band to FM. The frequency will be the last FM frequency used. The command is equivalent to cycling with the “Source” button until the FM band is selected.

SRCWX – Change Band to WX

Syntax: *T' t' SRCWX

Parameters: t A, B: Tuner ID

Command changes the band to Weather The frequency will be the last WX frequency used. The command is equivalent to cycling with the “Source” button until the WX band is selected.

SRCAUX – Select AUX Input

Syntax: *T' t' SRCAUX

Parameters: t A, B: Tuner ID

Command is same as AUX command.

OTHER COMMANDS

All commands must be addressed to only one of the two tuners in the NV-T2. All tuner commands begin with *T' x' (x is either A or B indicating either Tuner-A or Tuner-B). These emulate individual button pushed and are for interactive use. The results of one command depend on the commands before and after.

ONE – '1' Button

Syntax: *T' t' ONE

Parameters: t A, B: Tuner ID

Command is equivalent to pushing '1' button. If the tuner is currently in direct tuning mode, the command will be interpreted as another digit in the frequency otherwise a preset will be initiated.

TWO – '2' Button

Syntax: *T' t' TWO

Parameters: t A, B: Tuner ID

Command is equivalent to pushing '2' button. If the tuner is currently in direct tuning mode, the command will be interpreted as another digit in the frequency otherwise a preset will be initiated.

THREE – '3' Button

Syntax: *T' t' THREE

Parameters: t A, B: Tuner ID

Command is equivalent to pushing '3' button. If the tuner is currently in direct tuning mode, the command will be interpreted as another digit in the frequency otherwise a preset will be initiated.

FOUR – '4' Button

Syntax: *T' t' FOUR

Parameters: t A, B: Tuner ID

Command is equivalent to pushing '4' button. If the tuner is currently in direct tuning mode, the command will be interpreted as another digit in the frequency otherwise a preset will be initiated.

FIVE – ‘5’ Button

Syntax: *T' 5' FIVE

Parameters: 5 A, B: Tuner ID

Command is equivalent to pushing ‘5’ button. If the tuner is currently in direct tuning mode, the command will be interpreted as another digit in the frequency otherwise a preset will be initiated.

SIX – ‘6’ Button

Syntax: *T' 6' SIX

Parameters: 6 A, B: Tuner ID

Command is equivalent to pushing ‘6’ button. If the tuner is currently in direct tuning mode, the command will be interpreted as another digit in the frequency otherwise a preset will be initiated.

SEVEN – ‘7’ Button

Syntax: *T' 7' SEVEN

Parameters: 7 A, B: Tuner ID

Command is equivalent to pushing ‘7’ button. If the tuner is currently in direct tuning mode, the command will be interpreted as another digit in the frequency otherwise a preset will be initiated.

EIGHT – ‘8’ Button

Syntax: *T' 8' EIGHT

Parameters: 8 A, B: Tuner ID

Command is equivalent to pushing ‘8’ button. If the tuner is currently in direct tuning mode, the command will be interpreted as another digit in the frequency otherwise a preset will be initiated.

NINE – ‘9’ Button

Syntax: *T' 9' NINE

Response:

Parameters: 9 A, B: Tuner ID

Command is equivalent to pushing ‘9’ button. If the tuner is currently in direct tuning mode, the command will be interpreted as another digit in the frequency otherwise a preset will be initiated.

ZERO – ‘0’ Button

Syntax: *T' t' ZERO

Parameters: t A, B: Tuner ID

Command is equivalent to pushing ‘0’ button. If the tuner is currently in direct tuning mode, the command will be interpreted as another digit in the frequency otherwise a preset will be initiated.

ENTER – Enter

Syntax: *T' t' ENTER

Parameters: t A, B: Tuner ID

Command is equivalent to pushing select knob in.

PRE/DIR – Preset/Direct

Syntax: *T' t' PREDIR

Parameters: t A, B: Tuner ID

Command is equivalent to pushing “PRE/DIR” button.

PRE – Cycle Preset Bank

Syntax: *T' t' PRE

Parameters: t A, B: Tuner ID

Will cycle through available preset banks. Command is similar to “PRE/DIR” except will skip “Direct Frequency Entry” mode.

DIR – Direct Frequency Entry Mode

Syntax: *T' t' DIR

Parameters: t A, B: Tuner ID

Changes numeric keys into “Direct Frequency Entry” mode.

MONO – Mono

Syntax: *T' t' MONO

Parameters: t A, B: Tuner ID

Command will force output into Mono mode. Tuner will revert to stereo when frequency is changed.

STEREO – Stereo

Syntax: *T' t' STEREO

Parameters: t A, B: Tuner ID

Turns off Mono.

DISPLAY – Change Display Mode

Syntax: *T' t' DISPLAY

Parameters: t A, B: Tuner ID

Command is equivalent to pushing “Display” button.

CAT+ – Select Next Category

Syntax: *T' t' CAT+

Parameters: t A, B: Tuner ID

Command is equivalent to pushing ‘Category▲’ button.

CAT- – Select Previous Category

Syntax: *T' t' CAT-

Parameters: t A, B: Tuner ID

Command is equivalent to pushing “Category▼” button.