



COMMAND STATION QUESTIONNAIRE

By Ken West

NMRA Command Control Working Group

Introduction

The purpose of this questionnaire is to gather essential information about a DCC locomotive command station and/or booster as part of the conformance process. This questionnaire will be kept on file by the NMRA as part of the conformance test submission.

All applications for a DCS conformance seal must be accompanied by the following:

- A. A complete system for which conformance is to be tested. Including the command station, powerbooster, 2 cab units (if multiple cabs are supported) and all interconnecting cables.
- B. A complete set of user documentation.
- C. One or more images (preferably taken from an oscilloscope) which clearly show: 1) The amplitude and duration of the "1" bit including the time and amplitude scales. 2) The amplitude and duration of the "0" bit including the time and amplitude scales, with all cab parameters set to full stop, off, or zero. 3) If the control of an analog loco is a supported feature, the amplitude and duration of the "0" bit including the time and amplitude scales, with the analog loco cab set to full speed forward. 4) The amplitude and frequency of any ripple at the zero crossing including the time and amplitude scales.
- D. Certification that the Command Station Test Procedures have been successfully completed by the manufacture prior to submission for formal conformance testing.
- E. The manufacture must provide evidence that the DCS complies with the FCC rules. Please attach a copy of the FCC report.
- F. (**Optional**) A DCC decoder with NMRA plug, suitable for HO scale, which supports all of the DCS functions.
- G. A completed DCS Questionnaire for the system to be tested.

Basic Information

Please fill in the following information on the command station manufacturer.

Company Name: _____
Address 1: _____
Address 2: _____
City: _____
State/Province: _____
Country: _____
Postal Code: _____
Voice Phone: _____
FAX Phone: _____
E-MAIL Address: _____
WEB Page: _____
Manufacturer ID Code: _____

Please fill in the name of the person to contact concerning conformance matters.

Last Name: _____
First Name: _____
Middle Initial: _____

Please fill in the following information about the command station submitted for testing.

Model Number: _____
Serial Number: _____
Hardware Revision: _____
Firmware Revision: _____
Manufacturer Date: _____
Minimum Peak To Peak Output Voltage: _____
Maximum Peak To Peak Output Voltage: _____
Maximum Output Current: _____
Special Considerations For Output: _____
Intended scale(s): _____
User interface type (Console, Walkaround, Windows, etc.): _____
Special Consideration For Function Outputs: _____

Command Station Questionnaire

Standards

This section gives any special information that relates to the DCC standards. A command station must meet all aspects of these standards to receive the conformance seal.

S9.1

Are there any special considerations for part **A: Technique For Encoding Bits**?

Are there any special considerations for part **B: Command Control Signal Shape**?

Does the command station meet the applicable United States Federal Communications Commission electromagnetic interference requirements described in part **B: Command Control Signal Shape**? If so, please attach a copy of the relevant certification.

Are there any special considerations for part **C: Power Transmission and Voltage Limits For Transmitting Power Through the Rails**?

Command Station Questionnaire

S9.2

Are there any special considerations for packet sequences? For example, does the command station have any restrictions on packet sequences?

Are there any special considerations for part **A: General Packet Format**?

Are there any special considerations for part **B: Baseline Packets**?

Are there any special considerations for part **C: Frequency Of Packet Transmission**?

Recommended Practices

This section gives any special information that relates to the DCC recommended practices. Implementation of the features described in the following recommended practices is optional. However, the command station must implement these optional features in conformance with the recommended practice in order to receive the conformance seal.

RP9.2.1

This section deals with special information dealing with the optional extended packet formats. Please indicate if you support each format and, if so, any special considerations for the format.

Are there any special considerations for part **A: Address Partitions**?

Does the command station support 14 bit loco addresses as well as 7 bit addresses? _____

Does the command station support 9 bit accessory addresses as well as 6 bit addresses? _____

Does the command station support part **B: Broadcast Command For Multi-function Digital Decoders**? If so, are there any special considerations?

RP9.2.1 Commands Supported

The following table lists the possible RP9.2.1 extended packet commands. Please check the "Supported?" box for all RP9.2.1 commands supported by the command station. Use the "Notes?" box for any special considerations associated with the command.

Multi-function Commands Supported (Section C)

Table 1: RP9.2.1 Multi-function Commands Supported

| Command | Description | Supported? | Notes? |
|----------------------|-------------------------|------------|--------|
| 0000CCCD | Decoder Control | | |
| 0001CCCC | Consist Control | | |
| 00111111 | 128 Speed Step Mode | | |
| 010DDDDD 011DDDDD | 28 Speed Step Mode | | |
| 100DDDDD | Function Group 1 | | |
| 1011DDDD | Function Group 2 | | |
| 11110010 | Short Form Acceleration | | |
| 11110011 | Short Form Deceleration | | |
| 111001AA | Long Form Verify | | |
| 111011AA | Long Form Write | | |

Command Station Questionnaire

| Command | Description | Supported? | Notes? |
|----------|----------------------------|------------|--------|
| 111010AA | Long Form Bit Manipulation | | |

Accessory Commands Supported (Section D)

Table 2: RP9.2.1 Accessory Commands Supported

| Command | Description | Supported? | Notes? |
|-------------------|-----------------------------|------------|--------|
| 10AAAAAA 1AAACDDD | Accessory Command | | |
| 10AAAAAA 0AAACCaa | Accessory Decoder CV Access | | |
| 10111111 1000CDDD | Broadcast Accessory Command | | |

Nonstandard Commands Supported

The following table lists the possible nonstandard extended packet commands. Please describe the command in the "Description" box. Use the "Notes?" box for any special considerations associated with the command.

Table 3: Nonstandard Commands Supported

| Command | Description | Notes? |
|---------|-------------|--------|
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Command Station Questionnaire

RP9.2.2

This section deals with special information dealing with the optional configuration variables.

RP9.2.2 Configuration Variables Supported

The following table lists the possible RP9.2.2 configuration variables. Please check the “Supported?” box for all RP9.2.2 configuration variables supported by the command station. Use the “Notes?” box for any special considerations associated with the configuration variable.

Table 4: RP9.2.2 Multi-function Configuration Variables Supported

| CV | Bit | Description | Supported? | Notes? |
|-------|-----|--------------------------------|------------|--------|
| 1 | - | Primary Address | | |
| 2 | - | Vstart | | |
| 3 | - | Acceleration Rate | | |
| 4 | - | Deceleration Rate | | |
| 5 | - | Vhigh | | |
| 6 | - | Vmid | | |
| 7 | - | Manuf. Version No. | | |
| 8 | - | Manuf. ID | | |
| 9 | - | Total PWM Period | | |
| 10 | - | EMF Feedback Cutout | | |
| 11 | - | Packet Time-Out Value | | |
| 12 | - | Power Source Conversion | | |
| 13 | - | Analog Mode Function Status | | |
| 17+18 | - | Extended Address | | |
| 19 | - | Consist Address | | |
| 21 | - | Consist Addr. Active for F1-F8 | | |
| 22 | - | Consist Addr. Active for FL | | |
| 23 | - | Acceleration Adjustment | | |
| 24 | - | Deceleration Adjustment | | |
| 25 | - | Cab Speed Step | | |
| 29 | 0 | Locomotive Direction | | |
| 29 | 1 | FL Location | | |
| 29 | 2 | Power Source Conversion | | |
| 29 | 3 | Advanced Acknowledgment | | |
| 29 | 4 | Speed Table | | |
| 29 | 5 | Extended Addressing | | |

Command Station Questionnaire

| CV | Bit | Description | Supported? | Notes? |
|-------|-----|---------------------------|------------|--------|
| 29 | 7 | Accessory Decoder | | |
| 30 | - | Error Information | | |
| 33-42 | - | Function Output Locations | | |
| 65 | - | Kick Start | | |
| 66 | - | Forward Trim | | |
| 67-94 | - | Speed Table | | |
| 95 | - | Reverse Trim | | |
| 105 | - | User Identifier #1 | | |
| 106 | - | User Identifier #2 | | |

Table 5: RP9.2.2 Accessory Configuration Variables Supported

| CV | Bit | Description | Supported? | Notes? |
|-----|-----|----------------------|------------|--------|
| 513 | - | Address LSB | | |
| 514 | - | Auxiliary Activation | | |
| 515 | - | Time On F1 | | |
| 516 | - | Time On F2 | | |
| 517 | - | Time On F3 | | |
| 518 | - | Time On F4 | | |
| 519 | | Manuf. Version No. | | |
| 520 | | Manuf. ID | | |
| 521 | | Address MSB | | |
| 541 | 7 | Accessory Decoder | | |

Command Station Questionnaire

Manufacturer Specific Configuration Variables Supported

The following table lists the possible manufacturer specific configuration variables. Please describe the configuration variable in the “Description” box. Use the “Notes?” box for any special considerations associated with the configuration variable.

Table 6: Manufacturer Specific Configuration Variables Supported

| CV | Bit | Description | Notes? |
|----|-----|-------------|--------|
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Command Station Questionnaire

RP9.2.3

This section deals with special information dealing with the optional service mode commands. Please indicate if you support each format and, if so, any special considerations for the format.

Are there any special considerations for part **B: Service Mode Environment**?

Are there any special considerations for part **C: Entry to and Exit from Service Mode**?

Does the command station support the **Basic Acknowledgment Mechanism** of part **D**? If so, are there any special considerations?

Does the command station support the **Advanced Acknowledgment Mechanism** of part **D**? If so, are there any special considerations?

Does the command station support part **E: Service Mode Instruction Packets for Direct Mode**? If so, are there any special considerations?

Does the command station support part **E: Service Mode Instructions for Address-Only Mode**? If so, are there any special considerations?

Does the command station support part **E: Service Mode Instruction Packets for Physical Register Addressing**? If so, are there any special considerations?

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If **Physical Register Addressing** is supported, which of the fundamental 8 registers can be accessed?

Does the command station support part **E: Service Mode Instruction Packets for Paged CV Addressing**? If so, are there any special considerations?

Does the command station support **Appendix A: Address Query Instruction**? If so, are there any special considerations?

Command Station Questionnaire

RP9.2.4

This section deals with special information dealing with the optional fail-safe characteristics. Please indicate if you support each characteristic and, if so, any special considerations for the format.

Does the command station support part **A: Initialization of the DCC system?** If so, are there any special considerations?

Does the command station support part **B: Converting Between Different Power Modes?** If so, are there any special considerations?

Does the command station support part **C: Occurrence of Error Conditions?** If so, are there any special considerations?

Document Revision History

| Document Version | Date | Revised by | Notes |
|------------------|-----------|-------------|---|
| 0.1 | 23-Jan-96 | Ken West | Original Version |
| 1.0 | 15-Mar-97 | Brian Barnt | Revised RP Sections to match RP revisions |