Rowe CD100 Jukebox Tester

Users Guide

Eliminate the guess work of identifying faulty components
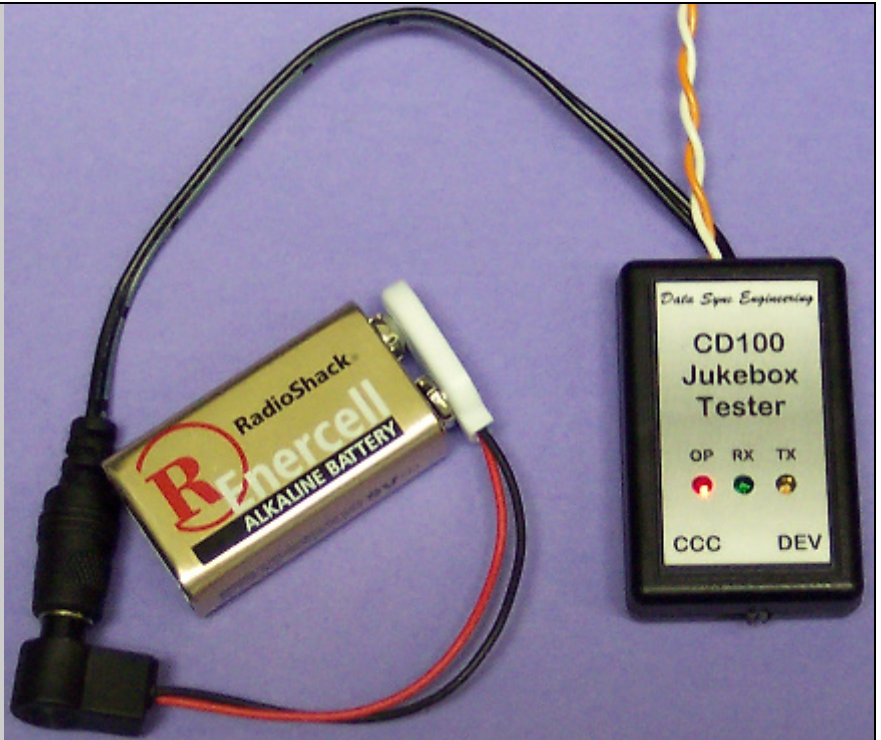
Individually Tests ...

Central Control Computer

CD Mechanism

MP3 Player

OBA or CBA Bill Acceptor

Features

- **Pocket-sized tool quickly tests and identifies the jukebox problem**
- **Switch selectable to test the Central Control Computer, CD, MP3 and Bill Acceptor**
- **Simulates the CD Mechanism to test and verify the Rowelink and CCC operation**
- **Simulates the CCC, plays first and last track of 10 CD's on the CD or MP3 player**
- **Activates and enables the operation of the Bill Acceptor (OBA-2 or CBA-2)**
- **Quickly initialize all CD's to 32 tracks (reduce CD mechanism wear)**
- **Shows received data, transmitted data and operating status**
- **Powered from a 9V battery or optional AC adapter**

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CD100 Jukebox

The CD100 jukebox contains five major components; the Power Supply, Power Amplifier, Central Control Computer (CCC), CD or MP3 Mechanism player (MECH) and the Bill Acceptor (BA).

Of these components, the Power Supply can be easily checked by viewing the three lit LED's at the Power Supply connector or you can measure the output voltages using a voltmeter. The +8 volt output on earlier jukeboxes should read between 8.0 to 8.5 volts, later model jukebox power supplies were modified to provide an output voltage between 9.0 to 9.5 volts.

The Power Amplifier can be checked by supplying a line level audio signal to the RCA input connectors. You can also connect the Jukebox Tester to the CD Mech or MP3 player and switch to DEV mode to play audio tracks.

On earlier CD100 models or MP3 converted jukeboxes, the CCC mutes the amplifier through an orange/black wire signal at connector position P13. You'll need to unplug this connector to hear audio output.

The last two components, the CD Mechanism or MP3 player (MECH) and the Bill Acceptor (BA), establish communication with the Central Control Computer (CCC) through a Rowelink connection. Rowelink is a two-wire RS-485 interface that uses the SN75176 differential bus transceiver IC designed for multipoint communications.

A blinking Rowelink LED indicates an attempt to transmit data but does not necessarily mean that data is actually being transmitted on the Rowelink. A defective interface IC may only allow communication in one direction or may not communicate at all. At worst, the bad IC can short out the link blocking communication to other devices.

If Rowelink communication is not achieved with the MECH unit within six minutes, the jukebox displays the "OUT OF ORDER" message.

If Rowelink communication is not achieved with the Bill Acceptor, the BA will either reject the bill or not pull it in at all. Same happens if the "OUT OF ORDER" message is displayed, regardless if the BA is working or not.

The MECH and BA units have no provisions for off-line testing, they rely strictly on Rowelink communications to operate. Typical method of repair ... Swap out each suspected unit until the jukebox starts working.

Not any more ! The Jukebox Tester is a valuable tool that eliminates the guess work out of identifying faulty units or faulty Rowelink cables. Quickly tests CCC, MECH and BA units individually. Definitely a time saver !!!

Tester Description

LED INDICATORS

OP

Normally on. Turns off or blinks to display function activity.

RX

Data being received from the Rowelink.

TX

Data being transmitted to the Rowelink.

FUNCTION SWITCH

CCC

Use for testing the Central Control Computer

DEV

Use for testing the CD Mechanism, MP3 Player & Bill Acceptor

DC Power

The CD100 Jukebox Tester operates from a DC power source between 8 to 15 volts providing at least 75 mA or higher. The power jack accepts a barrel type 2.1mm x 5.5mm power plug. Center pin is positive.

The tester comes with a 9-volt battery clip. This provides maximum portability while performing the jukebox tests. However, when the tester is not in operation, the power plug should be disconnected from the tester to avoid draining the battery power.

For long term testing, it is suggested that an AC power adapter, instead of the battery, be used to power the tester. You can purchase the AC adapter from most electronic stores or from us at the time of ordering.

Connecting to a Rowelink Cable
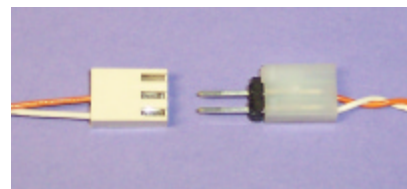
To connect two Rowelink cables together, insert one end of the 2-pin male header into a 3-pin connector. Then match wire colors, orange to orange and white to white, and connect the other 3-pin connector to the header.

Testing the Central Control Computer

The RX and TX LEDs

In CCC mode, the tester acts as a slave unit and only responds to commands from the CCC. The RX LED flashes whenever a CD Mechanism request is received from the CCC. All other communications are ignored, such as for wallboxes, IR remote and bill acceptor.

The TX LED will flash when transmitting a response to a received CD Mechanism request. If the Rowelink is not properly working, causing received data to be garbled, the TX LED will not flash.

In DEV mode, the tester acts as a master unit and initiates all communication activity. The TX LED flashes whenever a device request is being transmitted.

Supported devices are the CD Mechanism or MP3 Player and the OBA-2 or CBA-2 Bill Acceptor. When the testers function switch is moved from CCC to DEV mode, polling requests are transmitted to determine which device is attached. When communication with the device is established, the testing sequence is started.

The RX LED will flash when receiving a response from the attached device.

Playing Selections

You can make song selections using the tester. The tester will simulate the operation of the CD Mechanism, but will not produce any audio signal.

CD selection numbers 01 to 99 will cause the tester to simulate playing for 15 seconds then stop. CD selection number 00 will cause the tester to simulate playing until the jukebox CANCEL button is pressed.

If multiple selections are made, each selection is play simulated one after another.

The OP LED on the tester will turn off at the point that playing has started and will turn back on when playing has stopped.

The Power Amplifier can be checked by supplying a line level audio signal to the RCA input connectors.

On later CD100 models or upgraded models, (identified as having no connector in position P13 on the CCC) the Mechanism Control Unit mutes the amplifier through an orange/black wire signal usually at connector position P6. You'll need to unplug this connector to hear audio output.

CCC Test Setup

Turn off the jukebox power. At the Central Control Computer, remove all 3-pin plugs at connector positions P10, P11 and P12. Plug the Jukebox Tester into any one of these connector positions. Move the tester's function switch to CCC mode and apply power to the tester.

Turn on the jukebox power.

After a few moments you should see the RX followed by TX LED's rapidly flashing on the tester. The jukebox is now ready to operate.

If the RX LED is not flashing, examine the Rowelink Command LED on the Central Control Computer. If this LED is flashing then the problem may be a defective communication IC at location U19. The replacement IC part number is SN75176B.

If the Rowelink Command LED is not flashing check the +5 VDC LED, it should be on. If not, the CCC is not receiving power, check the power supply and all power connectors.

Otherwise, the Central Control Computer may be faulty.

Full Initialize

You can perform full initialization using the tester. This is where each disc is loaded, the TOC is read and the maximum numbers of tracks are recorded to memory.

To perform the initialization …

Enter SERVICE mode   (switch to SERVICE position)
Type 3
Type 0
Push POPULAR
Exit SERVICE mode   (switch to NORM position)

It takes about 1 minute to perform full initialization. During initialization, the OP LED on the tester will blink as each disc number is requested. The OP LED stops blinking when completed. All discs will be initialized to 32 tracks. You can use the tester to provide a quick initialization, then let the jukebox re-learn the actual track counts when selections are played.

To verify that all discs were initialized …

Enter SERVICE mode   (switch to SERVICE position)
Type 3
Type 4
The display should show **"INITIALIZED 100"**
Exit SERVICE mode   (switch to NORM position)

Testing the CD Mechanism, MP3 Player and Bill Acceptor

CD/MP3 Test Setup

Turn off the jukebox power. Unplug the CD Mechanism or MP3 Player's 3-pin connector from P10, P11 or P12 at the Central Control Computer. Attach this connector to the tester using the male-male pin adapter. Verify wire colors are matched, orange to orange and white to white. Move the tester's function switch to CCC mode.

Turn on the jukebox power and apply power to the tester. Move the tester's function switch to DEV. The TX LED will start flashing. When communication is established, the RX LED will begin flashing. The testing sequence starts.

If the RX LED is not flashing after a minute, examine the Rowelink Response LED on the CD Mechanism controller or the Activity LED on the MP3 Player. If this LED is rapidly flashing then the problem may be a defective communication IC. The replacement IC part number is SN75176B. (Also see *MP3 Player Operation).*

The testing sequence begins by playing the first track of ten consecutive CD's from the magazine followed by playing the last track of the same ten CD's. This testing sequence repeats over and over until stopped. During the first 6 minutes of testing, you may experience a sudden stop and restart of the CD Mechanism. This is okay, it's caused by the CCC attempting to reset the player.

The consecutive CD disc numbering sequence, or folder number sequence for the MP3 player, is 01, 03, 05, 07, 09, 11, 13, 15, 17 and 19. This sequence matches the sequential disc positions of the CD Mech magazine.

The OP LED on the tester will turn off when playing has started and will turn back on when playing has stopped. During the time that the song is playing (OP LED off) you can cancel the play by pressing the CANCEL button on the CD Mechanism or the function switch on the tester is moved from DEV to CCC then back to DEV.

If the OP LED on the tester is flashing, this indicates problems while trying to read the CD and that a second try will be attempted. The CD is returned to the magazine then reloaded back onto the player.

A worn out laser or the accumulation of smoke film and dust reduce the lasers focus and tracking ability. This causes CD skips which are most severe when playing higher track numbers. Other symptoms, such as the disc not spinning or spinning backwards, can also be related to focus problems. In most cases, cleaning the CD's and CD laser lens can solve the problem, but a worn out laser will require servicing. MP3 hard disk and flash card players do not exhibit this type of problem.

MP3 Player Operation

When the MP3 player is powered-up, the LED will flash once, pause for about 3 seconds, then begin rapidly blinking as song files are indexed. Depending upon the number of songs, this can take several seconds to complete. During this time, no communication with the tester is established. If a error is encountered during song file searches, the player will halt and slowly blink out the error code, such as two blinks, pause, two blinks, etc. You can move the tester switch to CCC to verify that an error code is being presented. The blinking error codes are …

1 Blink (or in some cases, no blinks after first flash)
MP3 board failure or unable to operate the hard drive or memory card. Verify HD/CF is properly inserted.

2 Blinks (Windows XP defaults to the NTFS filesystem)
Couldn't find FAT32 filesystem. Check the disk format.

3 Blinks
Couldn't find any folders. Check the disk contents.

4 Blinks
Couldn't find any MP3 files. Check the disk contents.

Bill Acceptor Test Setup

Turn off the jukebox power. Unplug the Bill Acceptor's 3-pin connector from P10, P11 or P12 on the Central Control Computer. Attach this connector to the tester using the male-male pin adapter. Verify wire colors are matched, orange to orange and white to white. Move the tester's function switch to CCC mode.

Turn on the jukebox power and apply power to the tester. Move the tester's function switch to DEV. The TX LED will start flashing. When communication is established, the RX LED will begin flashing. The Bill Acceptor is ready.

Insert a bill into the acceptor. If the bill is accepted, the OP LED will blink and the bill is moved to the stacker.

OBA-2
If the RX LED is not flashing, examine the +5 VDC and +24 VDC LEDs on the Control Unit. Check the RS485 Status LED. If this LED is rapidly flashing then the problem may be a defective communication IC.

CBA-2
If the RX LED is not flashing, check the POWER LED at the back of the Bill Acceptor. Examine the STATUS LED for a flashing error code. Verify the dipswitch settings.