CD-RW402

Technical Documentation

PRODUCT OVERVIEW

Traditionally CD players, CD recorders, and CD duplicators have been thought of as distinctly different products. TASCAM's engineers have broken these barriers with the CD-RW402, creating a single product that offers an uncompromising combination of all three CD products into a single, affordable recorder.

The CD-RW402's CD player functions offer enough capability for live theater or broadcast, yet remain simple enough for the novice. Functions like CD-text, call, locate points; fader start and auto ready make this the ideal machine for environments where there is no "take-two". Recording functions take advantage of the latest CD-R advances including overburn capability and improved auto ID modes. The CD-RW402 also offers the ability to edit CDs, remove dead space in a track, or add/remove track IDs.

For increased accuracy, a stutter-scrub mode allows you to nudge an edit or cue point with CD frame accuracy. Duplicating functions for both audio and data CD format scan run at 4x - convenient for limited in-house duplication. The CD-RW402 also has the ability to convert Orange Book CDs into Disk-At-Once Red Book compliant CDs.

MSRP $1,249.00

- 3-U Rack-mountable
- CD Editing Capability w/ Stutter Scrub
- PS/2 Keyboard Input for CD-TEXT and Control
- 2 Displays for Meters and 12 Characters of Text
- Uses Professional 74min and 80min Blank Media
- Overburn Capability for Extended Recording Time
- Duplicates Audio and Data CDs at 4x, 2x, and 1x
- ±9.9% Pitch Control (Deck 1 Only)
- Independent Analog Unbalanced RCA I/O
- Independent SPDIF Digital Coax and Optical I/O
- Built-in RAM Buffer for Precise ID Marks
- Parallel Control I/O for Custom Remotes & Tallies
- Call Function for Checking Play Cues
- Auto Cue and Auto Ready for Live Sound Cues
- Event Start Function (In Parallel Control)
- Selectable SCMS Status
- User Selectable Digital Fade In/Fade Out
- Headphone Monitor Select w/ Level Control
- Rugged TEAC Computer CD-ROM and CD-R Drives

CONSULTANT'S AND SYSTEM DESIGN SPECIFICATIONS

The TASCAM CD-RW901 is a 3U rack-mountable dual-well CD Player (well #1), CD player/recorder (well #2). Both decks have independent meters, 12 character text display, and each has a multi-purpose dial. Both decks are capable of auto-ready (pause at each track ID), fader start, EOM alerts, and shutter-scrub (jog mode) via multi-dial. Both wells utilize a rugged TEAC computer drive.

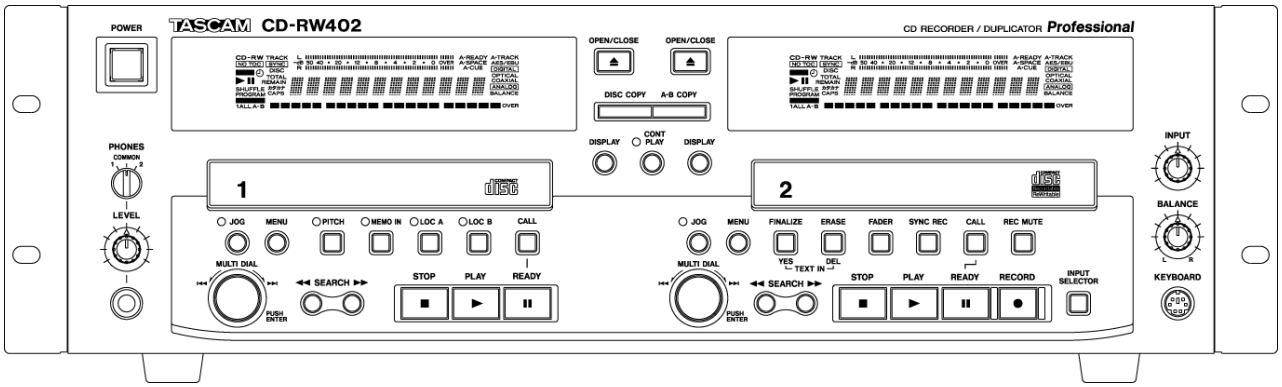
The CDRW-402 offers parallel control and tally messages. User selectable Fade In/Out. CD-Text and transport control is achieved via FS/2 keyboard (input on front panel). A headphone output w/volume control allows monitoring of individual or both wells.

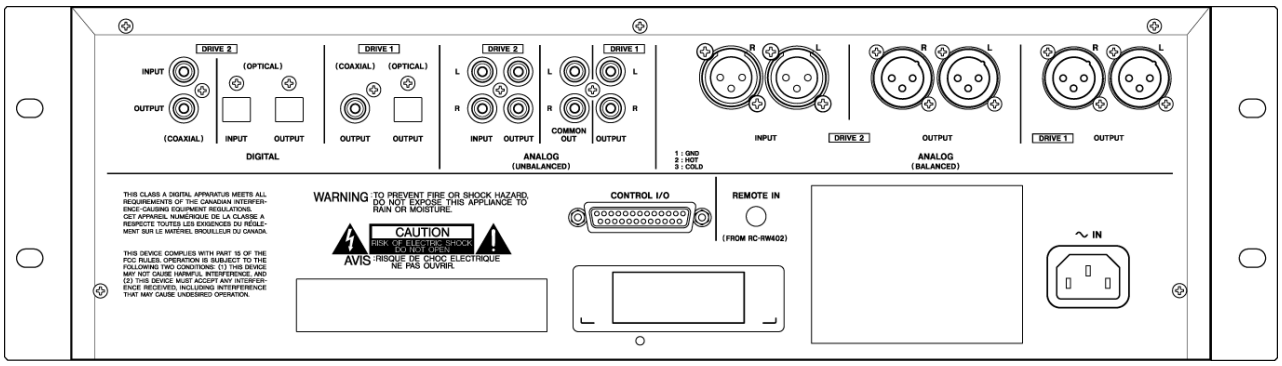
Well #1 – **(player)** Features 9 +/- pitch control, two-locate points, and call. Track advance and rewind are located on the multi-purpose dial. Dedicated analog outputs via balanced XLR connectors and unbalanced RCA jacks. S/PDIF Optical and Coax digital outputs.

Well #2 – **(player/recorder)** Features sync record, record mute, and call. Track advance and rewind are located on the multi-purpose dial. Dedicated analog inputs and outputs via balanced XLR connectors and unbalanced RCA jacks. S/PDIF Optical and Coax digital outputs.

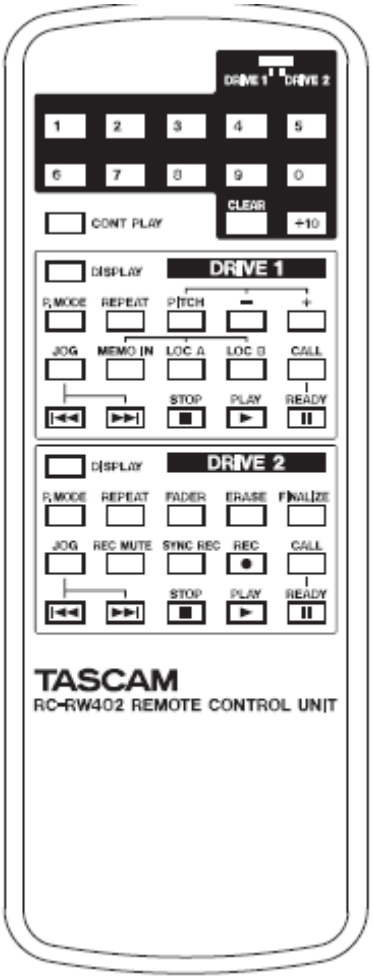
A common unbalanced RCA output is provided. Wired remote control (RC-402) is included.

PANELS





REMOTE



FS/2 KEYBOARD CONTROL

The CD-RW402 has the PS/2 port for entering CD-TEXT information. However, it can also be used for other functions as listed below:

Keys	Primary Command
[F1]	DECK 1, STOP
[F2]	DECK 1, PLAY
[F3]	DECK 1, PAUSE
[F5]	DECK 1, TRACK SKIP <<
[F6]	DECK 1, TRACK SKIP >>
[F7]	DECK 2, TRACK SKIP <<
[F8]	DECK 2, TRACK SKIP >>
[F9]	DECK 2, STOP
[F10]	DECK 2, PLAY
[F11]	DECK 2, PAUSE
[SHIFT] + [ESC]	DECK 1, MENU KEY
[SHIFT] + [ENTER]	DECK 1, PUSH MULTI DIAL (a)
[SHIFT] + [UP]	DECK 1, MULTI DIAL ↻ (a)
[SHIFT] + [DOWN]	DECK 1, MULTI DIAL ↺ (a)
[ESC]	DECK 2, MENU KEY
[ENTER]	DECK 2, PUSH MULTI DIAL (a)
[UP]	DECK 2, MULTI DIAL ↻ (a)
[DOWN]	DECK 2, MULTI DIAL ↺ (a)
[SHIFT] + [F11]	DECK 2, TITLE EDIT
[SHIFT] + [F12]	DECK 2, ARTIST EDIT

(a) When in Menu Mode

APPROVED MEDIA

Notes on CD-R Media:

Quality and recording characteristics of media from different manufacturers will vary from brand to brand. This has to do with the manufacturing processes of both the CD-R media and CD-R mechanism. Some media that does not work well with one CD-R mechanism may work reasonably well with another.

In order to take the guesswork out of selecting media, we are posting an approved list of media for use with the CD-RW900. At the time of this writing, media from each of these manufacturers was written to and verified.

CD-R / CD-R-DA approved manufacturers:
Sony, TDK, Taiyo Yuden, AMT, CMC, Ritek, Prodisc, Mitsubishi Chemical
CD-RW / CD-RW-DA approved manufacturers:
Sony, Ritek, Prodisc, AMT, CMC, Ricoh, Mitsubishi Chemical.

High-speed media is approved for use, meaning that the unit is not limited to 1x speed media.

ADVANCED FUNCTIONS

The CD-RW402 was designed to be more than just a professional CD-Recorder, it was designed to serve double duty as an advanced CD player for live or studio applications. This dual function design makes it highly advantageous in live theaters, radio production and broadcast environments, as well as recording studio environments.

Rugged reliability is key in a product like this one, and to ensure the best reliability and longevity we have used the very best CD-R technology in the business. It just so happens that our parent company TEAC is one of the world's leading data storage manufacturers, and is consistently winning awards for their CD-R design and products.

Unique Editing Functions

Change Track IDs - The CD-RW402 offers the ability to add or remove track IDs from a CD. Combine and Split edit functions essentially remove track IDs or add the IDs. For more accurate placement, a stutter-scrub mode is offered by pressing JOG on the front of the CD-RW402, then turning the MULTI-JOG dial.

A-B Copy - Trimming dead air from the track can easily be done on the CD-RW402. Deck 1 has two locate points, LOC A and LOC B. Simply place these locate points at the beginning and end of the piece of audio you want, and press A-B COPY. The new track will be written to the other CD tray.

CD-TEXT - Other CD-Recorders in the industry offer CD-TEXT capability, but they make a cell-phone's email letter system look convenient. The CD-RW402 allows you to plug in a standard PS/2 keyboard. Then, just type what you want for the disc name, artist name, and track names.

4x Disc Copy - The CD-RW402 is the only dual CD recorder on the market that is capable of duplicating audio and data CDs. Also, it has the fastest time, burning CDs at 4x speeds. As an added bonus, the CD-RW402 will convert track-at-once audio CDs into disc-at-once audio CDs during duplication. This makes the duplicated CD appropriate for mass duplication.

Advanced Live Functions

Auto Ready Function - This function is used in live production environments like theater and radio environments frequently. Auto Ready will play one track at a time, pausing at each track start ID it finds. This function saves a tremendous amount of time for engineers, since each sequential sound cue is automatically loaded.

Call Function - Pressing call stops the CD, and returns it to the time location where play began. This is typically used for checking a cue point, allowing you to be sure you are recalling the exact position you started from.

Auto Cue - Auto cue allows the CD mechanism to cue to the first audio in the track, not the location of the start ID. This means better response time at the start of the track, since dead space is eliminated.

Advanced Recording Functions

Selectable SCMS - SCMS codes are used on consumer grade CD-Recorders to limit the unauthorized distribution of recorded material. In professional environments, duplication of digital program is a regular necessity. The CD-RW402 allows the user to select the SCMS status written from Allow One Copy, Allow No Copies, or SCMS Free (No Restriction.)

Input Monitor - You can monitor the inputs of the CD-RW402 without engaging the CD-RW mechanism. This is useful when setting levels, or using the CD-RW402 for it's high quality A/D and D/A converters.

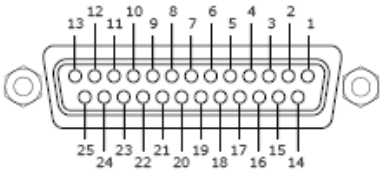
Professional I/O - The CD-RW402 offers independent balanced XLR inputs and outputs for each deck as standard. This allows for the best signal to noise ratio, especially over long cable runs like those found in the typical studio, live or broadcast settings.

Digital Level Adjustment and Digital Fades - The CD-Recorder will frequently be used to transfer audio from DAT, MiniDisc, or another CD. If the originally material was produced too quietly, the CD-RW402 has the ability to boost the recording level. Also, built in digital fade in and fade outs can be used to ensure smooth fade curves.

PARALLEL I/O

Pin	Signal
1	PLAY (Drive 2) In
2	STOP (Drive 2) In
3	CALL (Drive 2) In
4	FADER (Drive 2) In
5	NOT USED
6	+5V
7	NOT USED
8	+5V
9	NOT USED
10	PLAY (Drive 1) In
11	STOP (Drive 1) In
12	CALL (Drive 1) In
13	FADER (Drive 1) In
14	PLAY (Drive 2) Tally
15	READY (Drive 2) Tally
16	EOM (Drive 2) Tally
17	GND
18	NOT USED
19	NOT USED
20	NOT USED
21	NOT USED
22	PLAY (Drive 1) Tally
23	READY (Drive 1) Tally
24	EOM (Drive 1) Tally
25	GND

Control I/O Legend



Parallel Control Notes:

All command controls are labeled as "in" on the chart at left. The commands are active when brought to ground for more than 30 milliseconds or longer.

FADER START pin (22) operates as a latched function.

The Total Current of pin 6 (+5v) and pin 8 must be less than 100mA.

Output Signals are connected to an open collector with maximum voltage of 15V, and maximum current 50mA.

Drive 1

Media type	CD-R, CD-RW, CD-RDA, CD-RWDA
Frequency response	20 Hz — 20 kHz (playback ±0.8 dB)
S/N ratio	> 95 dB (playback)
Dynamic range	> 95 dB (playback)
Total harmonic distortion	< 0.005% (playback)
Channel separation	90 dB (playback: 1 kHz)
Wow & flutter	Unmeasurable (< 0.001%)

Drive 2

Recording media type	CD-R, CD-RW, CD-RDA, CD-RWDA
Recording resolution	16-bit linear
Recording sampling frequency	44.1 kHz
Frequency convertor input	32 kHz — 48 kHz
Frequency response	20 Hz — 20 kHz (playback ±0.8 dB, recording ±1 dB)
S/N ratio	> 95 dB (playback) > 90 dB (recording)
Dynamic range	> 95 dB (playback) > 90 dB (recording)
Total harmonic distortion	< 0.005% (playback) < 0.008% (recording)
Channel separation	90 dB (playback: 1 kHz) 80 dB (recording: 1 kHz)
Wow & flutter	Unmeasurable (< 0.001%)

Digital I/O

Digital inputs (drive 2 only)	
COAXIAL	RCA pin, IEC-60958 TYPE I, TYPE II — auto-detect
OPTICAL	TOSLINK, IEC-60958 TYPE I, TYPE II — auto-detect
Digital outputs (drives 1 and 2)	
COAXIAL	RCA pin, IEC-60958 TYPE II (SPDIF)
OPTICAL	TOSLINK, IEC-60958 TYPE II (SPDIF)

Analog I/O

UNBALANCED LINE OUTPUTS (1, 2, COMMON	Unbalanced RCA
Nominal output level	–10 dBV (FS –16 dB)
Maximum output level	+6 dBV
Output impedance	570 Ω (unbalanced)
BALANCED LINE OUTPUTS 1, 2	XLR-3 type (male) (1-gnd, 2=hot, 3=cold)
Nominal output level	+4 dBu (FS –16 dB)
Maximum output level	+20 dBu
Output impedance	75 Ω

UNBALANCED LINE INPUTS (2)	Unbalanced RCA
Nominal input level	–10 dBV (6dBV –16 dB)
Maximum input level	+ 6dBV
Input impedance	23 kΩ
BALANCED LINE INPUTS (2)	XLR-type (female) (1-gnd, 2=hot, 3=cold)
Nominal input level	+4 dBu
Maximum input level	+20dBu
Input impedance 12 kΩ	
PHONES output (switchable **1**, **2** or **COMMON**)	6 mm (1/4") stereo
Output level	20 mW + 20 mW (into 32 Ω)
CONTROL I/O	D-sub 25-pin female
KEYBOARD	Mini-DIN 6pin (conforms to PS/2 standard)
REMOTE IN	3.5 mm mini-jack (only for use with RC-RW402)
Writable disc formats	CD-DA (including CD-TEXT), CD-ROM (IS09660), CD Extra. When copying CD Extra discs, DISC copying allows copying of audio data, and DAO copying allows copying of data.

General specifications

Voltage requirements	USA/Canada 120 VAC, 60 Hz U.K./Europe 230 VAC, 50 Hz Australia 240 VAC, 50 Hz
Power consumption	100 V — 120 V: 34 W, 220 V — 240 V: 39 W
Applicable electromagnetic environment	E4
Peak inrush current	6.1 A (Pro CE)
Dimensions	483 x 138 x 301 (mm) 19 x 5.4 x 11.6 (in)
Weight	8 kg (17.6 lb.)
Operating temperature	5°C to 35°C (41°F to 95°F)
Supplied accessories	RC-RW402 remote control unit 2m (6 ft.) AC cord