

CBO-232: RS-232 CARD for JRC NRD-525.

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<https://geip.pagesperso-orange.fr/NRD525En.htm>
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DESCRIPTION, INFORMATION AND PRECAUTIONS

WARNING : *if the serial number of your JRC happens to be any of
BR36071 through BR36120, the CPU EPROM must be replaced.*

(With the first EPROM version 7DEJD0072 and the 1200 Bauds speed, you can have some communication errors).

With this card, you can remote your NRD-525 with a RS-232 terminal or a computer. You can access to the frequency, read/write memory, mode, IF filter, attenuator and AGC.

Check the package content :

- This notice (9 pages).
 - A quick reference guide.
 - A ½ page questionnaire.
 - The CBO-232 card (tested OK before sending).
 - An internal P47 - J4n 7 pins DIN shielded cable (tested OK before sending).
 - A RS-232 shielded cable, 3 wires (tested OK before sending).
 - A 15mm plastic spacer.
-

If you encounter technical problems, contact a qualified technician or a professional assistance.

Some interventions are delicate.

The author does not assume any responsibility about the following procedure, neither for any consequent damage or problem. You make this modification on your risk and responsibility.

Before starting work, be sure to remove the power cable and all cables.

Do not remove any part witch does not need to be removed.

Use adapted tools.

⚠ Warning ! This symbol indicates a particular precaution, or component sensitive to electrostatic discharge.
=> Before handling any components, be sure to wear an anti-static wrist strap or touch a grounded object.

=> WARNING : the contents in the preset memory may be lost after these operations.

CBO-232 card specifications:

- Based on a 8251 circuit and a programmable divider.
- RS-232 outputs with a classical circuit MAX232.
- Quartz reference: 3,6864 MHz.
- This card is installed in the CMH-632 connectors.
- The J47 connector is compatible with the JRC cable referenced H-6ZCJD00141.
- 9-pole female Sub-D RS-232 standard cable (DB9) - DIN.
- RS-232 configuration: 8 data bits, 1 stop bit, no parity.
- 300 and 1200 Bauds (optional 2400 and 4800 Bauds).
- An onboard LED (SLW) indicates the slow speed.
- If you have the RTTY CMH-530 card:
 - Characters converted can output to the RS-232,
 - An auxiliary output can be used by an external device to decode others modes (RTTY ASCII, CW...).

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1- REMOVING COVER

- Disconnect all cables.
- Remove the upper cover slowly by loosening 4 screws, taking care not to break the speaker wires.
- Remove the speaker connector (on the IF-AF AMP CAE-182 card).

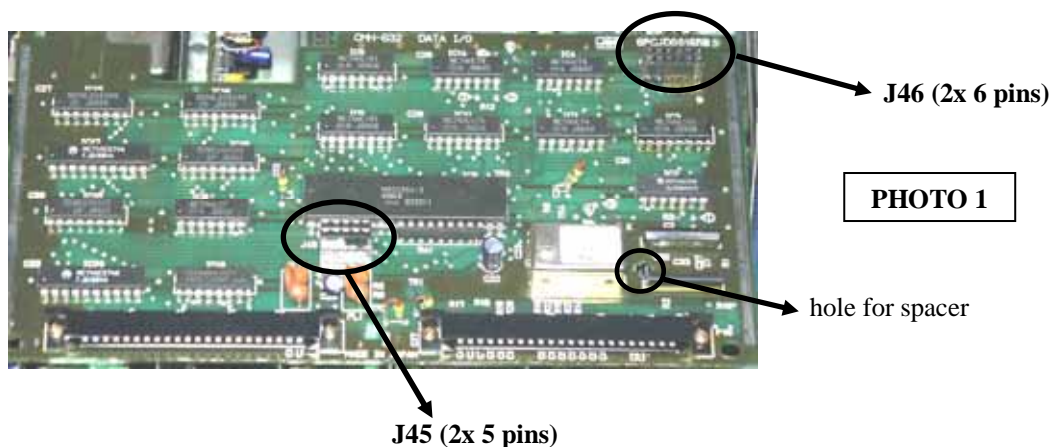
2- CMH-632 DATA I/O card

2.1- Removing

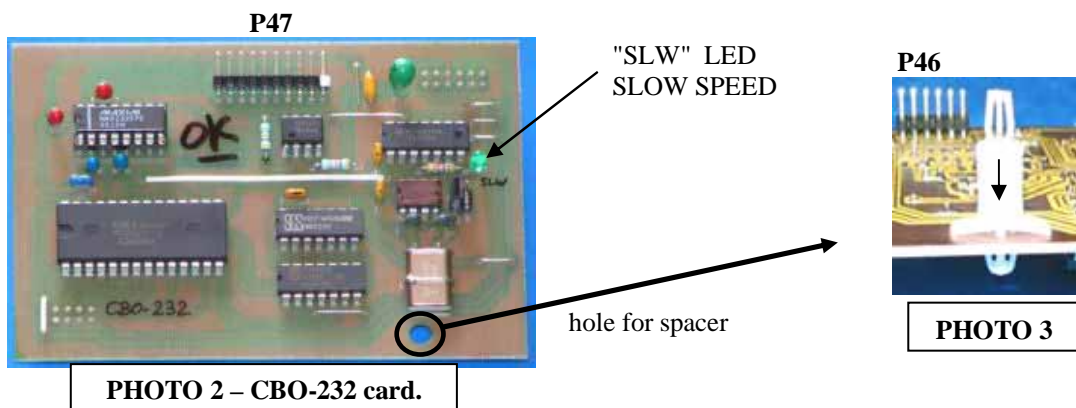
- Locate the DATA I/O CMH-632 card and remove it (insert the removal lever or a small screwdriver into the holes at both corners of the card).



2.2- Locating the connectors

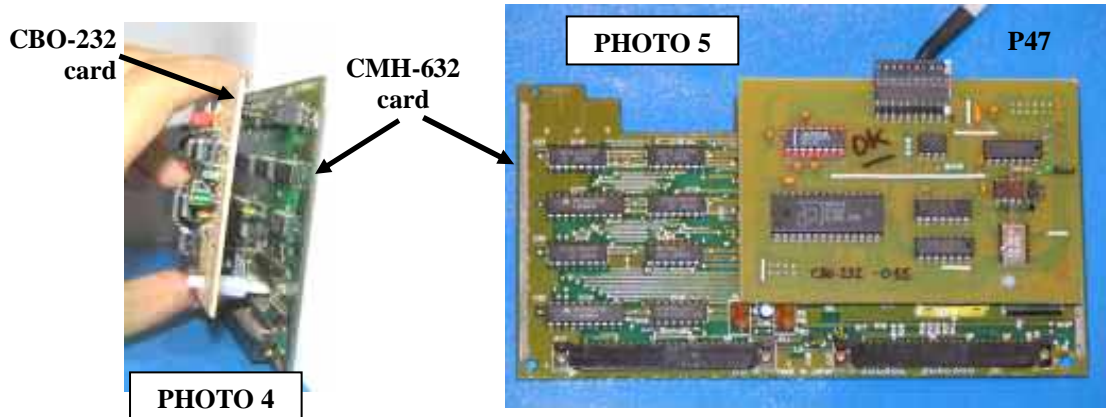
Locate the J45 and J46 connectors on the **CMH-632** card:



2.3- The CBO-232 card

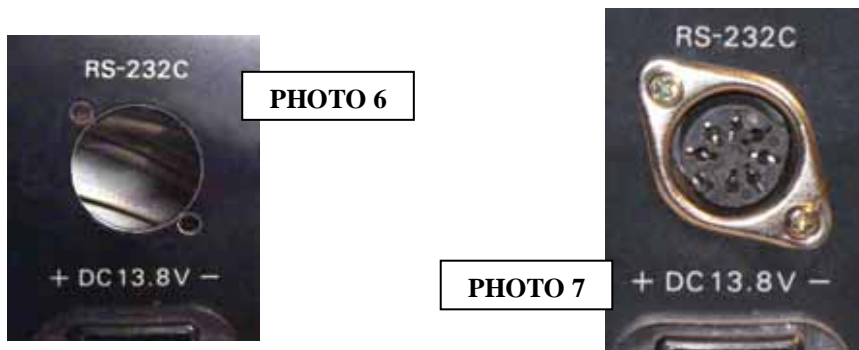


- Insert the plastic spacer in the hole of the CBO-232 card as indicated on the PHOTO 3.
-  Carefully insert the CBO-232 card in the J45 and J46 connectors, on the CMH-632 card. Make sure the spacer is fixed in the 2 cards. (See PHOTOS 3, 4 and 5).
-  **Incorrect installation can damage your receiver or the card !!**
Check all pins in all connectors.



3- CONNECTORS

- Remove the RS-232 plastic cover, on the rear panel of the receiver, see photo 6.
- From the outer side of the receiver, go the P47 connector (10 pins) through the RS-232 hole.
- Screw the DIN connector (See PHOTO 7).



- Connect the 10 pins P47 cable on the CBO-232 card, in the correct orientation, white mark is the pin 1. (See FIGURE 3, page 6).

4- CPU CARD MODIFICATION FOR RTTY MODE

If you have the RTTY CMH-530 card and an old CPU EPROM (before the V2.0 version), you can, if you want, send all the decoding characters on the serial port. You will do this modification (opening the "W3" jumper). See chapter 8.

⇒ After the V2.0 EPROM CPU version, this modification is not useful because this option is accessible with the NRD-525 keys.

W3 jumper	
Close :	(Origin).
Open (cut) :	The code converted RTTY are sending on the RS-232 output.

4.1- Removing the CPU card

- Locate the CPU CDC-353 card and remove it (insert the removal lever or a small screwdriver into the holes at both corners of the card).

4.2- Cut the W3 jumper wire

Locate the 4 jumpers on the CPU card. Cut the "W3" jumper as below:

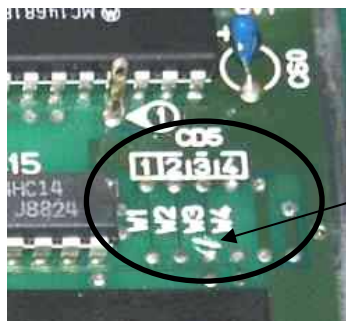


PHOTO 8

Cut the W3 jumper with a small cutter.

5- RE-ASSEMBLING THE RECEIVER

- Put the DATA I/O CMH-632 card back to the original position by securely inserting it along the rails. **Do not apply force on the CBO-232 card.**
- Make sure all the cards are seated properly in their slots.
- **Make sure there are no metal or other parts in your receiver.**
- Before closing the upper cover, connect the power cable and turn ON the power.

⚠ **The receiver should instantly work, if not, SHUTDOWN THE RECEIVER AND DISCONNECT THE POWER CABLE.**

Check all procedures. Make sure the cards are seated properly in their slots.

5.1- First test

- Press the **8** key with the **MEMO** key depressed and select "300" on the NRD-525 display.
⇒ On the CBO-232 card, the "SLW" LED lit on.
- Press the **8** key with the **MEMO** key depressed and select "1200" on the NRD-525 display.
⇒ The "SLW" LED turns off.
- Turn off the receiver and disconnect all cables.

(=> The SLW LED indicated the slow speed selection).

5.2- RE-ASSEMBLING

- Reconnect the speaker connector on the IF-AF AMP CAE-182 card.
- Mount the upper cover and the 4 screws.

6- CONNECTION CABLES

6.1- P47 internal cable <=> 7 pins DIN female connector

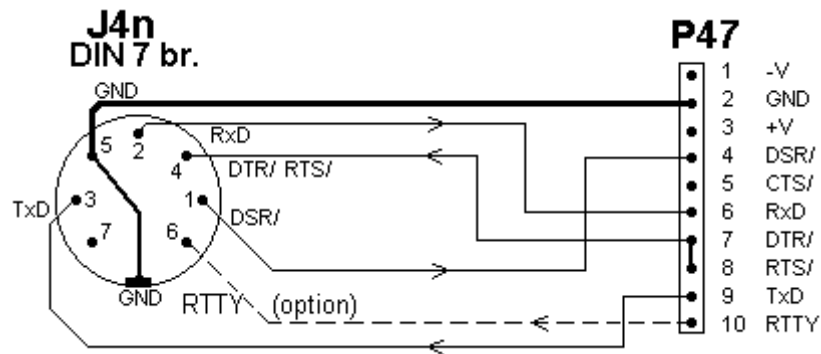


FIGURE 1
internal connector

J4n pins DIN connector	direction	J47 P47 pins	Function
nc	<----	1	-12V to -5V
5	-----	2	GND ground 0V
nc	<----	3	+5V to +12V
1	---->	4	DSR/ Data Set Ready
nc	---->	5 not connected	CTS/ Clear To Send
2	---->	6	RxD Reception Data
4	<----	7	DTR/ Data Terminal Ready
	<----	8	RTS/ Request To Send
3	<----	9	TxD Transmission Data
6	<----	10	RTTY <i>RTTY card demodulator output</i>
J4n pins	direction	J47 P47 pins	

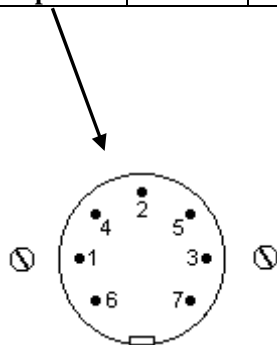


FIGURE 2
J4n DIN female connector
(JRC rear panel view)

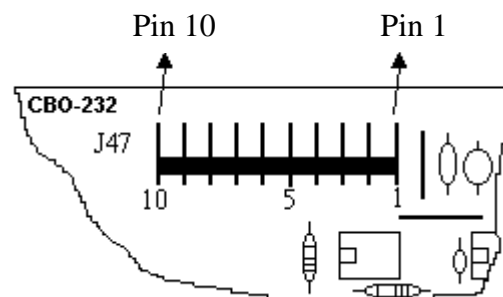


FIGURE 3
J47 connector

6.2- Simple 3 wires cable

Use a shielded cable, to limit noise.

7 pins DIN NRD-525 connector	connections	9-pole female Sub-D to computer connector
(GND) 5	●-----●	5 (GND)
(TxD) 3	●-----●	3 (TxD)
(RxD) 2	●-----●	2 (RxD)
		8 (CTS/)
		7 (RTS/)
(DSR/) 1	●-----●	6 (DSR/)
(DTR/) 4	●-----●	4 (DTR/)
		1 (DCD/)

6.3- 5 wires cable

Use a shielded cable, to limit noise.

7 pins DIN NRD-525 connector	connections	9-pole female Sub-D to computer connector
(GND) 5	●-----●	5 (GND)
(TxD) 3	●-----●	3 (TxD)
(RxD) 2	●-----●	2 (RxD)
(DTR/) 4	●-----●	4 (DTR/)
(DSR/) 1	●-----●	6 (DSR/)
		8 (CTS/)
		7 (RTS/)
		1 (DCD/)

7- USE

- WARNING: before connecting cables, be sure that all devices and the NRD-525 are connected to the earth (grounded power outlet).**
- Connect the RS-232 cable on the NRD-525 and an external device or computer and use a terminal program or other, with this configuration:
 - 300 or 1200 speed,
 - 8 data bits,
 - 1 STOP bit,
 - no parity.
- All the commands are in upper-case letters.
- To access on the NRD-525 RS-232, you must be send a **H1** command to the receiver (See chapter 7.9) with your device or computer. All the key switches, PBS, BFO and tuning are locked. Then you can access to the receiver with your RS-232 device. All the commands are described in the chapters 7.2 to 7.11.

7.1- SELECTION OF BAUD RATE ON THE NRD-525

- By pressing the **8** key with the **MEMO** key, you can select the 300 and 1200 Bauds rate, by turns.
- The NRD-525 display indicates: "300" or "1200" for 300 and 1200 Bauds.
- To clear this indication, press the **CLR** key.

⇒ After the V2.0 EPROM CPU version, you can access and use the 2400 and 4800 Bauds rate.

7.2- A function, attenuator

Select on/off 20dB attenuator.

A0 off
A1 on (ATT lit on).

7.3- B function, bandwidth filter

Select IF bandwidth filter.

B0 WIDE filter
B1 INTER filter
B2 NARR filter
B3 AUX filter

B4 direct 12KHz (no filter) ⇒ *This function is valid only after the V1.4 CPU EPROM version.*

7.4- C function, channel

Select and display a memory.

The receiver sends its status (see chapter 7.12).

Cxxx xxx on 3 digits from 000 to 199

7.5- D function, mode

Select receiving mode.

D0 RTTY (see chapters 4 and 8)
D1 CW
D2 USB
D3 LSB
D4 AM
D5 FM
D6 FAX

7.6- E function, recording

Write in the current memory channel. The receiver sends an audio beep.

E1

7.7- F function, frequency

Select a frequency on 8 digits.

Fxxxxxxxx

Example : **F02800345** for 28,00345 MHz
F14413025 for 144,13025 MHz (with the VHF/UHF option).

7.8- G function, AGC

Select AGC.

G0 AGC SLOW
G1 AGC FAST
G2 OFF

7.9- H function, remote

Sets on/off of external control. All the key switches are locked. The receiver sends its status (see chapter 7.12). Then you can access to the receiver with your RS-232 device.

H0 normal
H1 remote mode - "REMOTE" and **LOCK** lit on.

7.10- I function, information

The receiver sends information to the RS-232 port. It sends the status (see chapter 7.12).
On the receiver, when the channel, frequency, mode, AGC... is changed, the data changes are sent on the RS-232 port. This function is sent alone, without the **H1** function.

I0	normal mode
I1	information mode - " <i>REMOTE</i> " is lit.

7.11- J function, displayed personal parameters

⇒ This function is valid only on the V1.4 and V1.5 CPU EPROM version.

J1	displayed your personal parameters on the RS-232:
-----------	---

```
CBO V1.5 xxxxxx EPROM Version
NRD-525 serial number name
```

7.12- STATUS

- After some functions, the receiver sends its status like this:

C014	memory N°14
D2	USB mode
B2	NARR IF filter
G1	AGC FAST
A0	attenuator off
F01410815	14,10815MHz frequency

- Each time you send a function from the external device, the receiver sends back the same instruction to confirm it.
Example: if you send **A1**, the receiver sends back **A1** on the RS-232 port.

ONLY IF YOU HAVE THE CMH-530 RTTY DEMODULATOR OPTION :

8- RTTY CMH-530 CARD

- If the CPU W3 jumper is cut (see chapter 4), all the RTTY CMH-530 decoding codes are sent on the serial port (and at the same time on the J44 - "PRINTER" port). In this case, if the **H1** or **I1** function is sent from the external device, all the data are mixed (RTTY signal and status, frequency...).
- If the CPU W3 jumper is closed, the RTTY CMH-530 decoding codes are sending only on the J44 PRINTER port.

The auxiliary output (DIN connector, pin 6) deliver the demodulated RTTY output with a +/-5 to +/-12 Volts signal level. This signal will be decoded with an external device or a computer.

Then, you can decode others modes (BAUDOT RTTY, ASCII RTTY, AMTOR, SITOR, CW...).

You can select the SHIFT width, with the **MEMO** **6** function and the BFO. (Referring to the CMH-530 card notice).

Example for the CW : pick up the CW tone by the MARK or the SPACE filter in the RTTY demodulator.

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