

November 16, 2009

No. ZSM00123

To Icom authorized distributor

**Confidentiality Level**

- Public
- Dealer
- Distributor

**Model : IC-F5020/F6020 series all versions**  
**Subject : Modification for back to back repeater**

**Explanation:**

This service bulletin shows how to modify the IC-F5020/F6020 series transceivers for the back to back repeater function.

**Procedure:**

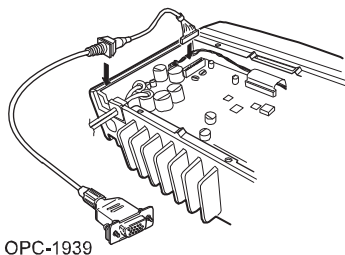
**1. Preparation**

Following items are required for back to back repeater

- IC-F5020 or IC-F6020: 2 PCS
- OPC-1939: 2 PCS
- Connection cable with D-sub 15 pin male plug on both sides (see the illustration page 3/4)

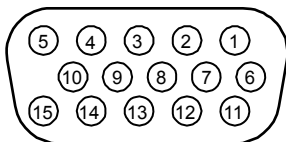
**2. Hardware configuration**

2-1 Connect the OPC-1939 to J6 on the MAIN units for each transceiver.



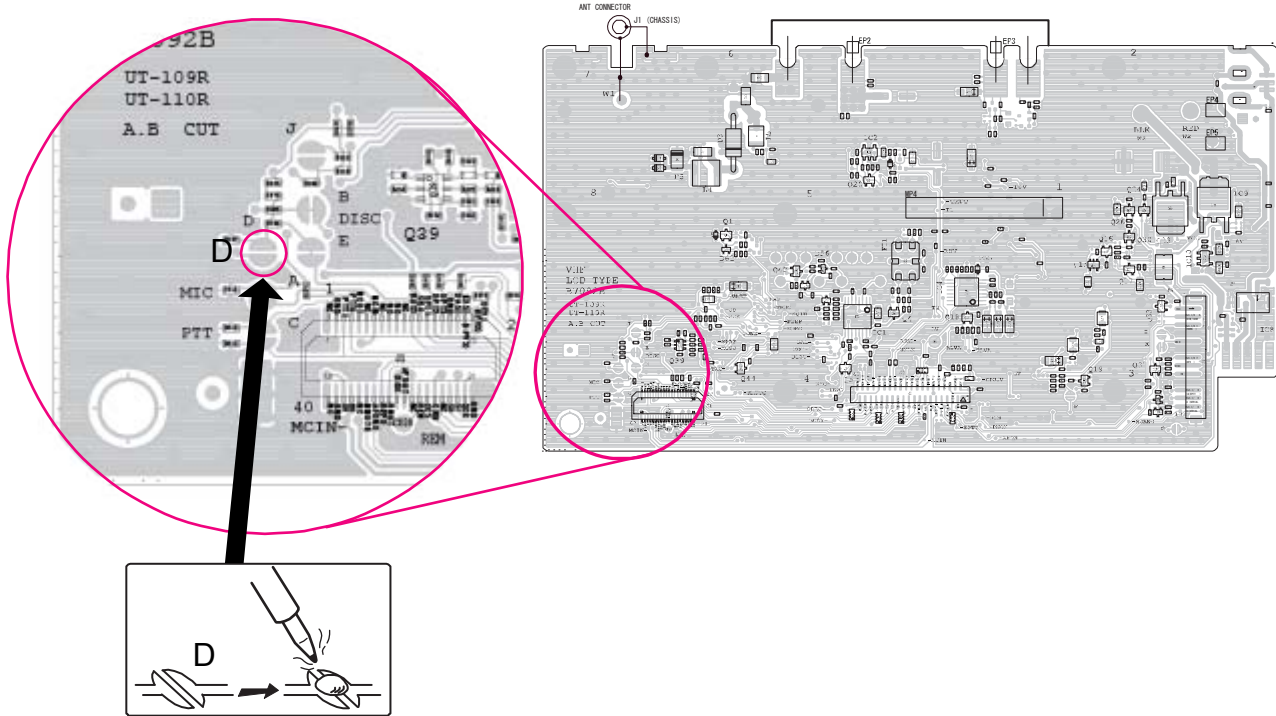
OPC-1939

OPC-1939 D-sub 15pin



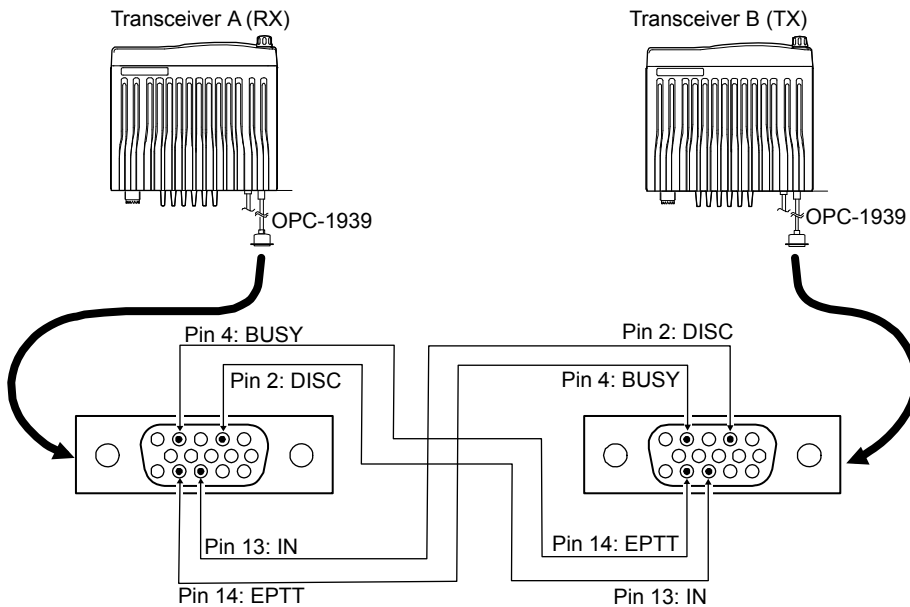
OPC-1939	MAIN J6	Description
Pin 1	Pin 4	GND
Pin 2	Pin 7	DISC
Pin 3	Pin 10	GND (IN shield)
Pin 4	Pin 12	Ext. I/O 4 (SERIAL)
Pin 5	NC	-
Pin 6	Pin 2	Ext. I/O 6 (DIM/IGSW)
Pin 7	Pin 5	Ext. I/O 7 (AFO)
Pin 8	Pin 8	GND (DISC shield)
Pin 9	NC	-
Pin 10	Pin 13	Ext. I/O 10 (SERIAL)
Pin 11	Pin 3	Ext. I/O 11 (HORN)
Pin 12	Pin 6	GND (AFO shield)
Pin 13	Pin 9	IN
Pin 14	Pin 11	Ext. I/O 14 (EPTT)
Pin 15	Pin 1	VCC

2-2 Bridge the coffee beans "D" with solder as shown in the illustration below.



	<b>Coffee beans</b>	<b>Setting</b>	<b>Default</b>
A	MIC Option	---	Short
B	Rx Signal Option	---	Short
C	PTT option	---	Short
D	Ex Mod Direct	Short	Open
E	Option Mod Direct	---	Short
F	Ex Mod VCO	---	Open
G	AFO Cut	---	Open
I	AFO Cut	---	Open
J	CTCSS FILTER	---	Open
K	Ext.I/07 Cut	---	Short

2-3 Two transceivers should be prepared for building one back to back repeater. Connect cables between the transceiver A (OPC-1939) and transceiver B (OPC-1939) as shown in the illustration below.



This connection cable should be made by your end.

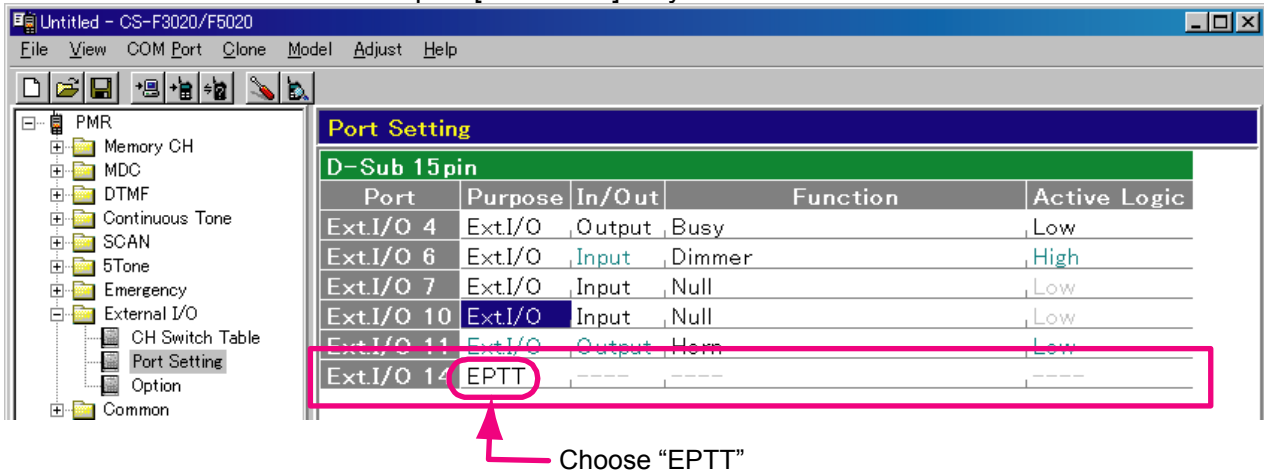
### 3. Software configuration

Set some parameters of EXT. IO ports with CS-F3020/F5020 cloning software.

#### • EXT. I/O 4

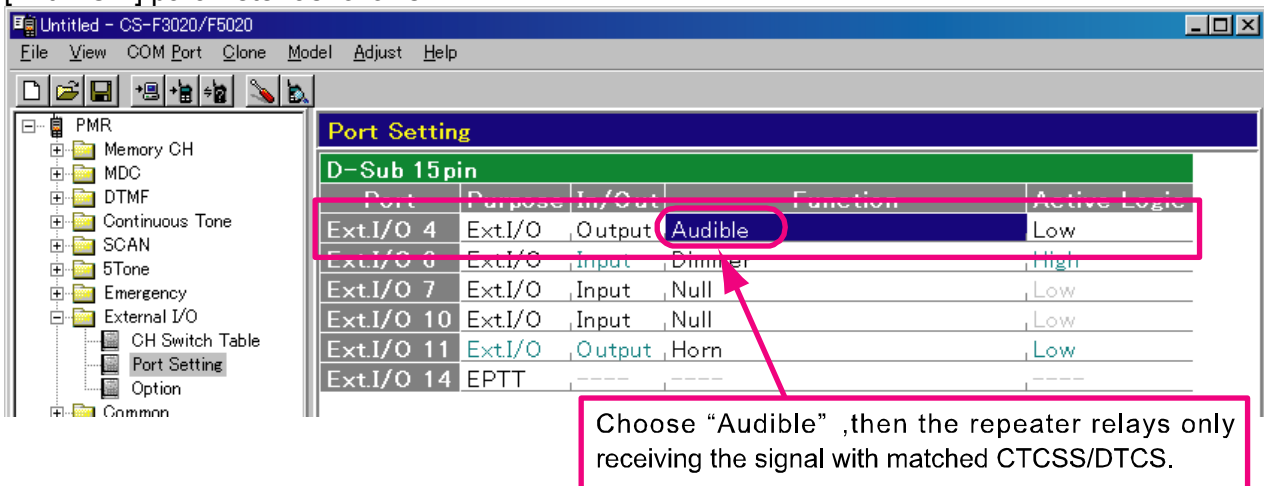
Port	Pin	Dir	IO	Function	Active Logic
Ext.I/O 4	Ext.I/O	Output	Busy		Low
Ext.I/O 6	Ext.I/O	Input	Dimmer		High
Ext.I/O 7	Ext.I/O	Input	None		Low
Ext.I/O 10	Ext.I/O	Input	None		Low
Ext.I/O 11	Ext.I/O	Output	Horn		Low
Ext.I/O 14	EPTT	---	---		---

- **Ext. I/O 14:** EPTT can be set port [Ext.I/O 14] only.



- **“Audible” parameter:**

If you want to configure the back to back repeater as closed repeater controlled by CTCSS, set [Ext. I/O 4] parameter as follows.



Required tools: Soldering iron, Screw driver, PC with CS-F3020/F5020 cloning software

OPC-1122/U cloning cable

Estimated work time: 30–40 min. /unit