

INTERFACING  
CES WIRELESS  
TRK-240-A001 MOBILE DATA TERMINAL  
MDC-210-A001 Base Modem  
MDC-150-A001 Base Modem  
TO  
SEA MODEL ESP520DX DATA RADIO



This application note provides the basic cable wiring information for connecting a SEA *ESP520DX* data radio to either the CES Wireless Model *MDC-210 A001* or the CES Model *MDC-150 A001* base modem controller or the CES Wireless *TRK-240-A001* Mobile Message Display Terminal (MDT). This note provides the necessary wiring and setup information for a basic data system. The information in this application note is believed to be correct at the time of issuance but is provided strictly as a courtesy to SEA customers without warranty.

**1. Minimum system requirements:**

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- 1 - CES *TRK-240 A001* Message Display Terminal configured for use on an SEA Data Radio.
- 1 - CES *MDC-210 A001* or *MDC-150 A001* Base controller with related application software.
- 2 - SEA *ESP520DX* Data Radios programmed for Data Operation. Refer to Section 3.
- 2 - Radio to TRK-240 A001 interface cables (supplied by CES part number TRK-240/01). Refer to section 2 for details.
- 1 - PC to *MDC-210 A001* or *MDC-150 A001* interface cable (not supplied). Use standard RS-232 DB-9 (female) to DB-25 (male) interface cable.

**2. Radio to MDT cable:**

**ESP520DX**  
**DB-25 Male**

***CES TRK-240 A001 MDT***  
**DB-25 Male**

<u>PIN #</u>	<u>Description</u>	<u>PIN #</u>	<u>Description</u>
1 & 11	GND	2	Ground (BLK)
5	PTT	11	Press to Talk (L. BRN)
6	CTS	13	Busy/Trunk (GRY)
10	RD	3	Receive Audio (YEL)
12	TD	4	Transmit Audio (ORG)
13	+13VSW	1	Power Input (RED)

**Warning: Be sure to mark each end of the cable as both ends are the same.**

### 3. ESP520DX Programming:

- Program the desired modes in the *ESP520DX* to match the REPEATER SYSTEM(S) which will be used or CHANNEL(S) for talk-around use if no repeater is being used. Refer to the *ESP520DX* programming manual for instructions on programming the radio for DATA operation.

Jumper JU105 on the ESP520DX computer PCB-0505-02 board must **NOT** be installed for 1200 bps (Bell 202 or MSK) data operation when trunking data transmission is also desired. A regular mode (not available on test modes) is programmed for 1200 bps data operation as follows:

#### **Required Configuration Programming:**

Data Option Type: MSK

#### **Required Mode Programming:**

Type: Trunked or Conventional  
Area: Site Area bit  
Data Enable: Voice & Data or Data Only  
Home: Desired home channel of site  
Busy Channel Lockout: Y  
Repeater Channel: Channel number in Home position  
Priority #2 ID: Data DTL ID

When the radio is on a mode programmed for Voice & Data, the Local Mic may key for voice operation and the MDT may key for data operation. When the radio is on a mode programmed for Data Only, only the MDT may key it. Please note if

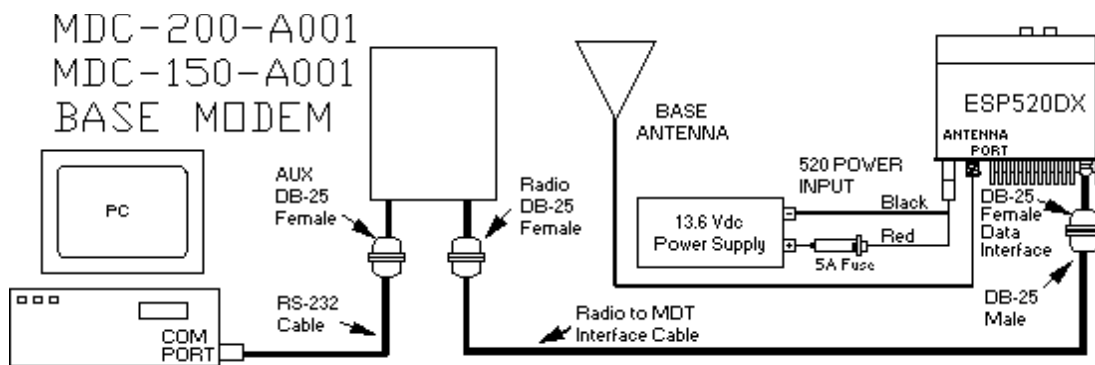
selecting Voice & Data operation, a TX and an RX ID (that do not match the Data ID) are also required for the mode programming.

#### 4. SEA Repeater system programming:

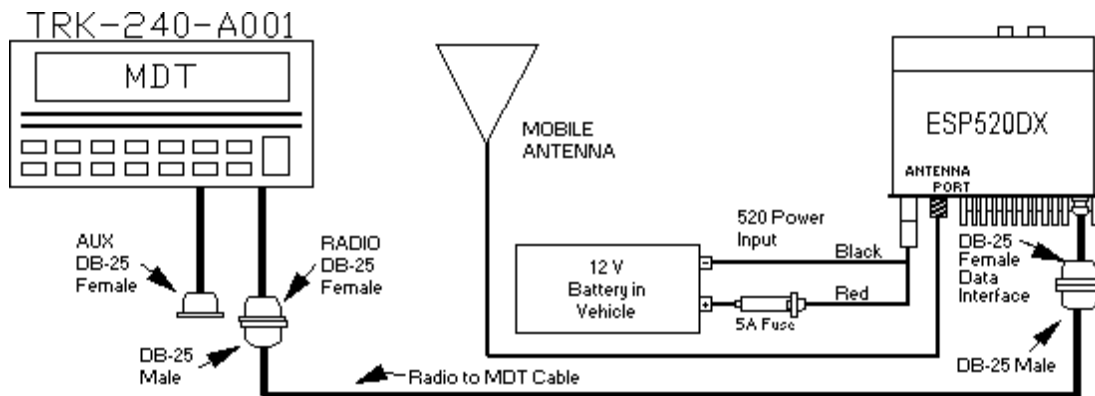
- Optional: Talk-around users may bypass this section.

Program repeater(s) according to the *ESP1000/ESP1100* Instruction manual with the correct Channel Number, Area Bit and Home Channel. Test the repeaters with a couple of mobiles in **VOICE** mode to insure system is functioning properly before using the **DATA** mode on the mobiles.

#### 5. Base Station Configuration:



#### 6. Mobile Station Configuration:



#### 7. CES Set-Up Parameters for Conventional Data Operation:

- **TX Level** = 1Vp-p (Adjust R15 on Modem board while monitoring level with an oscilloscope on pin 3 of DB-9 connector into radio.)

**RX Level** = 800mVp-p (Adjust R10 on Modem board while monitoring level with an oscilloscope on TP1 on same board.)

Baud rate = 1200      Radio Type = BUSY

- Lead In Delay = 10 (100mS) default  
Busy/Request Check = 50 (500mS)  
Request Window = 200 (2000mS)  
Grant Check = 20 (200mS)  
Grant Window = 200 (2000mS)  
Ack Response Time = 25 (250mS)  
Ack Wait Time = 500 (5000mS)  
Retry Window = 500 (5000mS)

#### **8. CES Set-Up Parameters for Trunked Data Operation:**

- **TX Level** = 1Vp-p (Adjust R15 on Modem board while monitoring level with an oscilloscope on pin 3 of DB-9 connector into radio.)

**RX Level** = 800mVp-p (Adjust R10 on Modem board while monitoring level with an oscilloscope on TP1 on same board.)

Baud rate = 1200      Radio Type = LTR

- Lead In Delay = 10 (100mS) default  
Busy/Request Check = 50 (500mS)  
Request Window = 200 (2000mS)  
Grant Check = 20 (200mS)  
Grant Window = 200 (2000mS)  
Ack Response Time = 25 (250mS)  
Ack Wait Time = 500 (5000mS)  
Retry Window = 500 (5000mS)