

# MX92x Series RJ45 SOCKET

## INTRODUCTION

An RJ45 socket is provided on the front panel for connection of a microphone. This socket is wired for compatibility with other industry standard microphones. The desktop microphone is compatible with the MX92X and MX800. Also provides RS 232 Communication between radio and PC.

*Please use this document in conjunction with the main technical manual.*



## SOFTWARE MENU SYSTEM

The MX92x series Base\Repeater comes with its own internal menu system accessed with any general terminal package. The menu system allows the user to change several configuration settings to suit the environment in which the MX92x must operate.

The menu system is entered through a terminal emulator program. The settings are 57600 baud, no parity, 8 data bits and 1 stop bit. HyperTerminal, which is included with Windows, is a suitable program for this purpose.

The command 'RMENU' is entered on the terminal, this command is not case sensitive. (Firmware Ver 0.2.0 and above Carriage return is required after typing "RMENU ↵")

The user will then be presented with a menu system from which various settings and configurations can be selected. To exit the menu system the <ESC> key can be pressed.

## HYPER TERMINAL, NEW CONNECTION

1. On the **File** menu, click **New Connection**.
2. In the **Name** box, type a name that describes the connection. (eg.MX92X)
3. In the **Icon** box, click the appropriate icon, and then click **OK**.
4. In the **Connect To** dialog box, select Com port you wish to use, and then click **OK**.
5. Set Com port properties, (The settings are 57600 baud, no parity, 8 data bits and 1 stop bit, no hardware control) and then click **OK**.
6. Type "RMENU" to access the MX92X (Firmware Ver 0.2.0 and above Carriage return is required after typing "RMENU ↵")

See hyper terminal help screen for further help.

## INTERFACING INFORMATION

When an audio connection and a RS232 Control are required at the same time, use a double adaptor RJ45 socket (Figure 1-1). Be sure not to run cables side-by-side or use a common cable, other wise noise for RS232 cable maybe induced onto the audio cable.



(Figure 1-1) 8P8C RJ45 Modular double adaptor

## MICROPHONE LINE INPUT LEVEL

The required nominal deviation or Peak deviation is dependent on whether the radio is narrow or wide. The following table lists the required level for each case:

Bandwidth	FM Nominal Deviation (kHz)	FM Peak Deviation (kHz)
Narrow (12.5kHz spacing)	1.5	2.4
Wide (25kHz spacing)	3.0	4.8

Table 1-1 Nominal Deviation

The radios factory default is to work in the Nominal mode. The radio also can operate in a peak deviation mode. To change modes use the built in menu system.

--Software Switch Configuration Menu--  
Nominal / Peak deviation.

The MX92x series also has two fix MIC sensitivity gain points. These settings are Fist Mic and Desk Mic modes, these can be set via software control though the built in menu system.

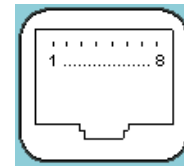
--Microphone Configuration Menu--  
Desk MIC / Fist MIC.

The fist Mic settings is for microphones that have a build in amplifier and require less sensitivity.

The desk Mic setting is for those that require more sensitivity such as MIC without a built in amplifier.

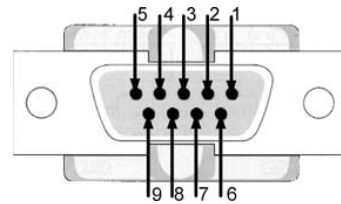


(Figure 1-2)  
RJ45 8P8C Plug

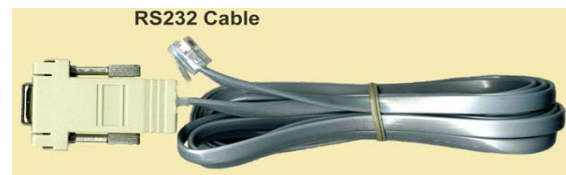


(Figure 1-3)  
RJ45 8P8C Socket front View

SKL Pin No.	Function	Comment
1	Low level muted RX VF	600ohm Z, filtered and De-emphasis. Line level $\approx$ -20dbm under 600ohm load.
2	+8VDC	Current limited.
	PCB > Rev G.3 +12VDC	
3	Microphone PTT	Pulled to +5V via 100k resistor. Connect to ground for PTT.
4	Microphone VF	600 ohms Z, gain and compression functions are software controlled. Desk Mic $\approx$ -43dbm <i>Compression enable.</i> Fist Mic $\approx$ -23dbm <i>Compression enable.</i>
5	EARTH common	Pin 5 DB9M (PC RS-232).
6	Hook / Monitor switch	For quiet base use. Connect to ground for quiet base operation.
7	Radio RS-232 TxD	Pin 2 DB9F (PC Rx/D RS-232).
	<b>OR</b>	<b>OR</b>
	M-lead output (Carrier Detect)	M-lead function when SKL-Pin8 is pulled up to +5 -12VDC via pin2. (Subject to firmware)
8	Radio RS-232 Rx/D	Pin 3 DB9F (PC Tx/D RS-232).
	<b>OR</b>	<b>OR</b>
	Enable M-lead Function	Enable M-lead Function



(Figure 1-4)  
DB9 Female- socket viewed from front of connector.



(Figure 2-0)  
MX92X RS232 Programming Cable

## M-LEAD FUNCTION

There are two options available depending on the age of the unit. The first step is to determine which version of firmware your radio is using A or P type.

## BACKGROUND INFORMATION

The MX92x series radios comprise of the MX920A, MX920P and MX921. The MX920A and MX920P are collectively known as the MX920, the main difference between them is that the MX920A uses the Mitsubishi M16C62A family, specifically the M30620FCAFP chip, while the MX920P uses the Mitsubishi M16C62P family, specifically the M30624FGPFP chip.

The differences are that the M30620FCAFP chip has 128 kbytes flash memory and 10 kbytes RAM. The M30624FGPFP chip on the other hand, has 256 kbytes flash memory and 20 kbytes RAM. The M30624FGPFP chip will be used for all future production. The M16C62P family has different chip initialisation and I2C-bus routines when compared to the M16C62A family. No further firmware development will be carried out on the M16C62A family due to memory restrictions. All new functions/feature will be developed on the M16C62P family. A list of firmware features is available from our web site <http://www.spectraeng.com.au/mx920-docs.shtml> # "MX920 Firmware Update Version History"

## IDENTIFY THE MICROPROCESSOR

It is important to use the correct firmware file when upgrading the MX92x firmware due to the differences between the chips. The simplest method to identify the chip that is installed in the MX92x is to issue the command 'RESET' in the serial terminal and look for the words 'MX920', 'MX920A', 'MX920P' and 'MX921' in the first line of the boot-up screen. The MX920A will have either 'MX920' or 'MX920A'.

Another method of identifying the installed chip is to run the bootloader. This is done by either cycling the power or issuing the 'RESET' command while the 'ACCESSORY' switch is depressed. The bootloader monitor will respond with either 'MxMon', 'MX920AMon', 'MX920PMon' or 'MX921Mon'. 'MxMon' is the prompt used for the older MX920A bootloaders. The 'VERSION' command can be issued while in the bootloader monitor mode. Possible results include 'M16C/62P' for the M16C62P family and 'M16C/62A' for the M16C62A family. The user

can issue the 'RESET' command to return the MX92x to normal operation.

Or open the radio and look at the main micro (IC2) and read the model number of it .M30620FCAFP the third letter from the (RSH) indicate the correct type to use.

## IMPORTANT

Loading the incorrect firmware into the MX92x radio will cause the radio to cease operating. In the worst case the unit will have to be sent back to Spectra Engineering to reload the firmware and bootloader.

Note# Both types can be downloaded from Spectra's web site.

<http://www.spectraeng.com.au/mx920-docs.shtml>

## ACTIVATING M-LEAD

The **(A)** type microprocessor requires option one to be used which requires hardware modifications.

Please see the [CM001-1 Mx920 M-lead Mod Overlay .PDF](#) diagram for M-lead function.

The **(P)** type microprocessor with new firmware allows the menu option "M-lead through serial port TX" which will provide an M-lead on the RS232 TxD port when the RxD serial port is pulled up to +3-12VDC (via SKL Pin2) to active function. A simple driver circuits maybe required on the TxD (SKL Pin7) when interfacing to peripherals.

## TESTING M-LEAD FUNCTION

Using a multimeter measure the TxD (SKL Pin7). This line should go to approx. +9V when the radio receives and approx. -9V when not receiving.

## CONNECTING TWO MX920's BACK-TO-BACK

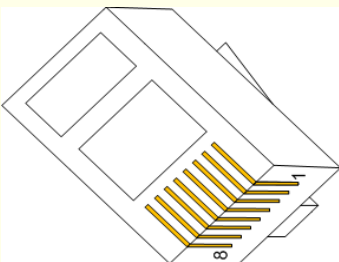
A very simple interface cable provides the ability for back-to-back repeaters, repeater to drop links and link-to-link configurations.

The follow software menu settings are required when connecting Back-to Back Interface Cable;

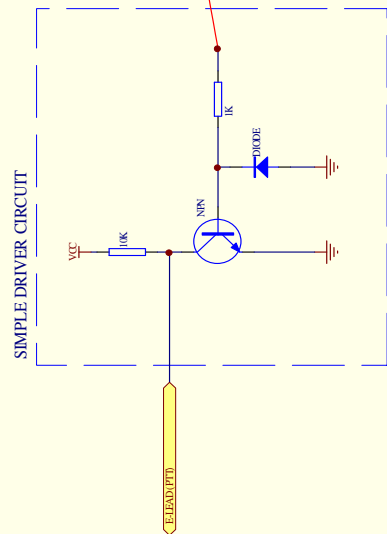
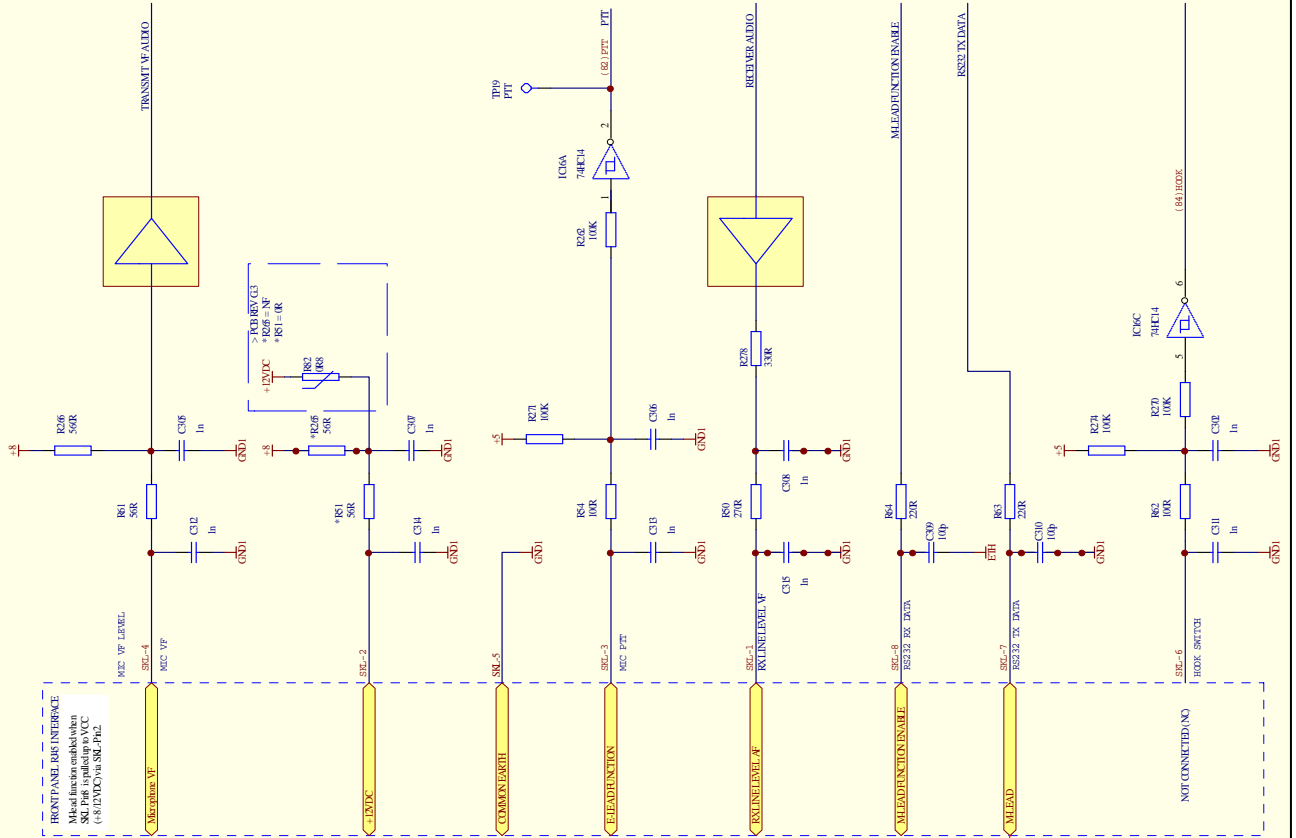
1. M-lead through serial port TX  
ENABLE
2. Microphone input level  
Fist microphone (high level)
3. Input audio compressor : Off

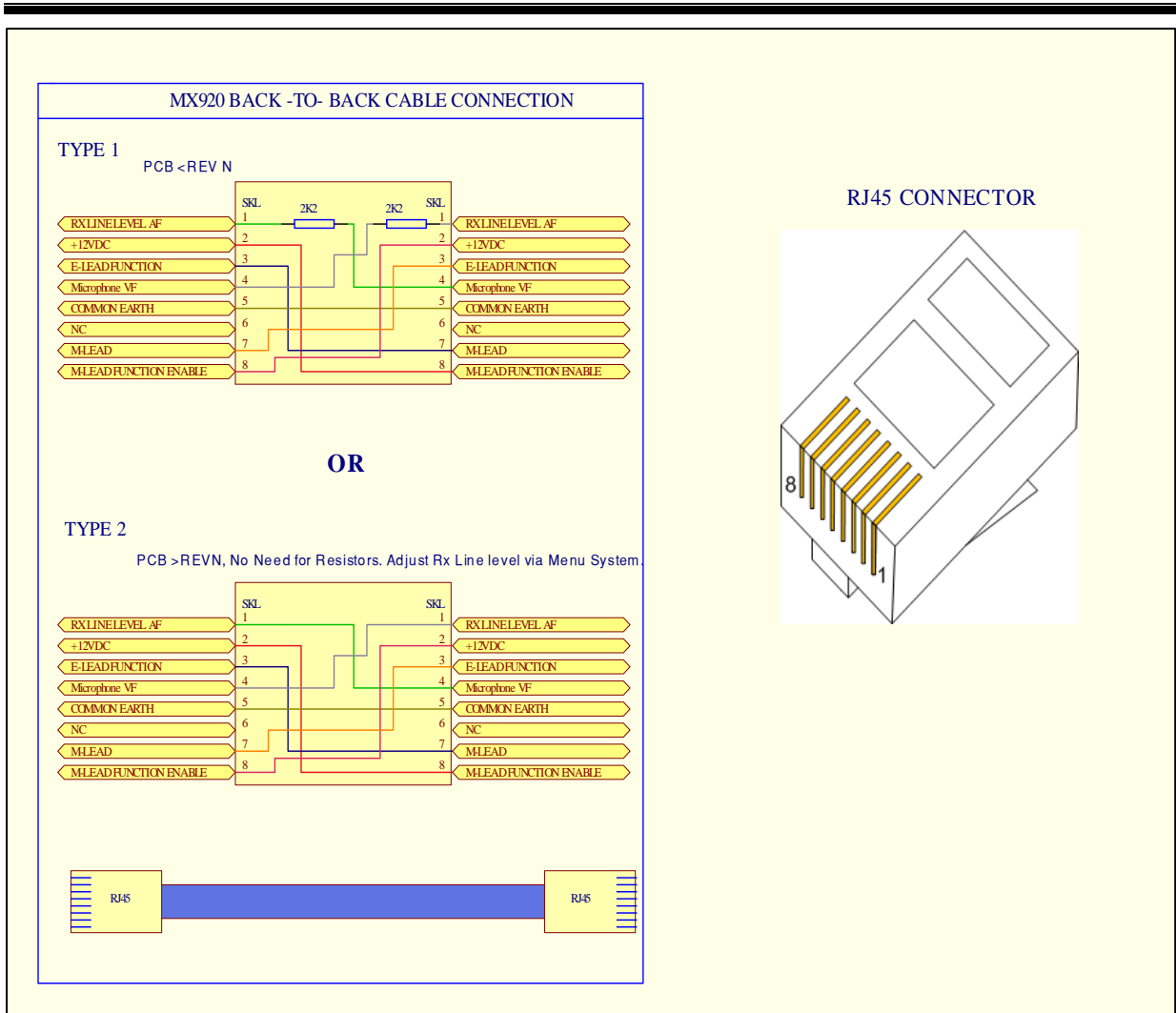
Please see figure 3.0 for cable connection.

RJ45 CONNECTOR



MX920 CIRCUIT INTERFACE





(Figure 3.0) Interface Overview