



*Easy-to follow guide to connecting your new
MFJ-1278/1278T Multi-Mode Data Controller
between your radio and computer*

CAUTION: Read all Instructions Before Operating Equipment

MFJ ENTERPRISES, INC.

P.O.BOX 494, MISSISSIPPI STATE, MS 39762, USA

COPYRIGHT © 1990 MFJ ENTERPRISES, INC.

Introduction

This MFJ-1278 Fast-Start Manual is intended to provide you with the minimum Information necessary to install your MFJ-1278 or MFJ-1278T "Turbo" Multi-Mode as quickly as possible. For detail operation, please see the main instruction manual.

The difference between the MFJ-1278 and the MFJ-1278T is that the MFJ-1278T has the 2400 modem installed. If your MFJ-1278 does not have the 2400 modem installed, it can be purchased separately (Model MFJ-2400) and installed by the user. With the 2400 modem installed, your MFJ-1278 can operate 300 baud, 1200 baud and 2400 bps packets.

The Computer Installation section assumes that you have purchased one of the MFJ Starter Packs. If you are not using the MFJ Starter Pack, you should refer to the main MFJ-1278 Owner's Manual for Computer interface connections. However, you may still use the Radio Installation and the other parts of the Fast-Start manual.

Your MFJ Starter Pack consists of terminal Software and a serial cable to connect between the MFJ-1278 and your Computer.

The Starter Packs available are MFJ-1289 for IBM and compatible Computers, MFJ-1282B for Commodore 64/128 Computers and MFJ-1287B for the Macintosh Computer.

MFJ-1289 Starter Pack includes the MULTICOM advanced terminal program. MULTICOM supports multi-gray levels FAX and SSTV receiving and transmitting. It also supports VGA packet picture passing. Other unique features this program gives you are: Auto-Router™ lets you store digipeater node routes for easy execution, Multi-Word™ makes it easy for you to transmit any portion of a file, Packet Multi-Plex™ lets you send and receive packet messages during binary file transfer. MULTICOM is fully menu driver, and it is very easy to use. It has dedicated function buffers for each mode of Operation.

MFJ-1289 MULTICOM is highly recommended if you are using an IBM or compatible Computer with your MFJ-1278.

MFJ-1282B for the Commodore C64/128 and MFJ-1287B for the Macintosh Computers also support Multi-Gray FAX/SSTV Operation.

I. INSTALLATION

A. Power Supply

Your MFJ-1278 is supplied with an AC adapter. Plug the power supply into a 110 VAC outlet and plug the 2.1 mm coaxial plug into "POWER" jack locate at the rear of the MFJ-1278.

For operation on AC line voltage other than 110 V AC, you must obtain a suitable AC adapter which will provide 12 VDC at 500 mA to operate your MFJ-1278.

If it is necessary for you to wire the 2.1 mm coaxial plug for your power supply, wire the 2.1 mm plug so that the center pin is positive and the outside sleeve is ground.

B. Computer Interfaces

This computer installation applies to those who are using the MFJ Starter Pack with IBM and compatibles, Commodore C64/128 and Macintosh computers. If you are not using one of these computers, or if you are not using an MFJ Starter Pack, then you must refer to the main MFJ-1278 instruction manual for computer installation.

The cable supplied with the Starter Pack must be t used in this installation. If you are not using the Starter Pack computer cable to make this connection, you should refer to the main MFJ-1278 instruction manual, Chapter 2 "Computer Interfacing" to verify that the cable you are using is correctly wired.

WARNING: IMPROPERLY WIRED CABLE COULD DAMAGE YOUR MFJ-1278 AND/OR YOUR COMPUTER!

1. Connect the cable from the computer to the MFJ-1278 as follows:

- IBM and compatibles:
Connect the cable end with DB-25 male to the back of the MFJ-1278 RS-232 connection mark "RS-232". Then connect the other end of the cable with DB-25 female to COM1 or COM2 RS-232 port of your computer.
- Commodore C64/128
Connect the cable end with 8-pin TTL connector to the back of the MFJ-1278 TTL connector marked "TTL", Then connect the other end of the cable to the user port of the C64/128.

Follow the instruction supplied with the Starter Pack carefully. Make sure that the cable is wired correctly and also make sure that the connector is oriented properly before plugging it to the MFJ-1278 and the Computer.

- Apple Macintosh
Connect the cable end with DB-25 female to the back of the MFJ-1278 RS-232 connector marked "RS-232". Connect the other end of the cable to the Computer modem port.

2. Load the terminal program by following the procedure described in the terminal program documentation.

3. Make sure that the terminal program parameters are set as follows:

Baudrate:	9600 (4800 for C64/128)	Wordlength:	8
Stopbit:	1	Parity:	None

4. Turn on the MFJ-1278.
5. Press the "Return" key several times in succession.

MFJ-1278 will sign-on with the sign-on message and end with the CMD: command prompt.

If the sign-on message is garbled, this may be caused by the wordlength and parity of MFJ-1278 not matching the terminal parameters. Remove the cover of the MFJ-1278 and disconnect the shorting Jumper at JMP5. JMP 5 is located next to the battery. After about 2 minutes, reconnect the shorting Jumper at JMP5.

Note: Removing JMP 5 disconnects the memory backup battery and resets all MFJ-127S parameters to default values. The wordlength and parity default values of the MFJ-1278 are 8 bits and no parity. This matches the terminal parameters as suggested above in step 3.

6. After the MFJ-1278 has signed on and the CMD: command prompt is displayed, type "Display" and press "Return" key.

MFJ-1278 will display a long list of parameter and end with the CMD: command prompt.

The above procedure verifies that the MFJ-1278 is communicating with your Computer.

C. Radio Interface

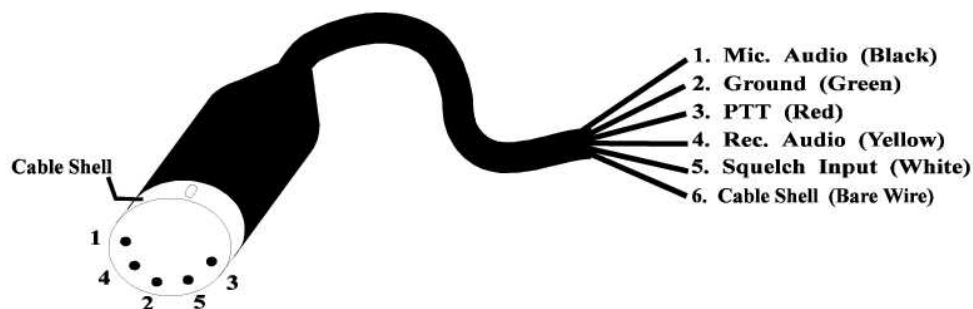
The first step in connecting the MFJ-1278 is to wire a cable to connect the MFJ-1278 Radio Port to the microphone or accessory connector of the radio. The radio cable supplied with your MFJ-1278 has one end already wired with a 5-pin DIN connector. You will need to wire the other connector to this cable to fit your radio.

MFJ offers optional pre-assembled cable to connect the MFJ-1278 to some radios. Contact MFJ dealer or MFJ for more information about these pre-assembled cables. Also available from MFJ dealer or from MFJ is a "TNC-to-Microphone" switch box (MFJ-1272B) which allows you to switch your radio between using the MFJ-1278 or using the microphone without disconnecting cables. Contact MFJ or MFJ dealer for more information concerning this TNC/MIC switch box. If pre-assembled cable or switch box is not available you must wire a cable to fit your radio.

IMPORTANT: The audio input to the MFJ-1278 must be fed through pin 4 of the MFJ-1278 radio Port. **DO NOT** feed audio input through the Speaker jack in the rear of the MFJ-1278.

The Speaker Jack is used to connect a Speaker. It is NOT an audio input.

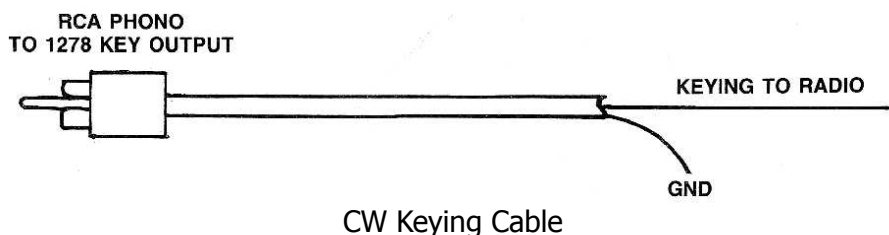
1. Wire the radio cable to MFJ-1278 as shown by the following diagram:



Radio Port Cable

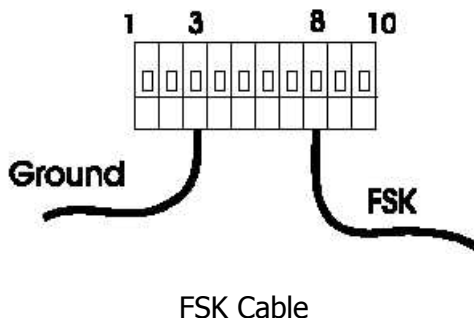
Note: Specific wiring diagrams for many Kenwood, ICOM & Yaesu radios are shown at the end of this Fast-Start manual. Check to see if your radio is listed.

2. Once the cable is properly wired, connect the DIN end to the MFJ-1273 Radio port 1 or Radio port 2. Connect the other end to the radio.
3. Other connections which you may wish to make are:
 - CW keying:
Connect a shielded audio cable from the KEYING OUTPUT to the KEY input of your radio. Use the Grid Block for tube type radio or Direct for solid state radio. Wire the keying cable as follow:

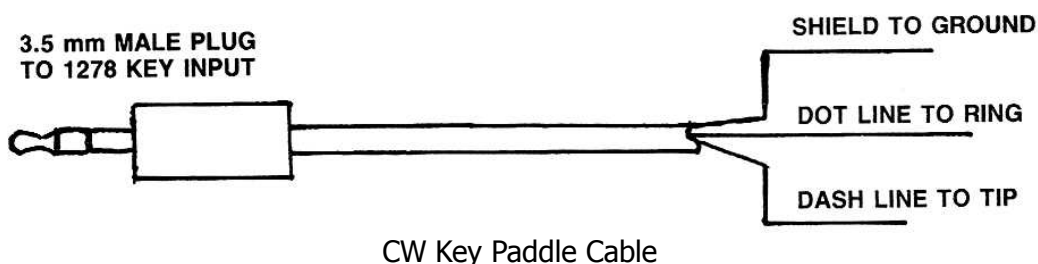


- FSK Connection:
If your HF radio permits FSK Operation, this connection can be made thru the use of the TTL connector in the rear panel of the MFJ-1278. Only two lines (Pin-8 FSK and Pin-3 ground) are needed in making the FSK connection to your radio. Use the 8-pin IDC connector supplied with your MFJ-1278 to make the FSK cable. See Diagram below.

Note: The polarity of the FSK signal is defaulted to normal on the MFJ-1278. If your radio requires you to provide a reverse FSK signal you will need to relocate the shorting jumper to position 2 & 3 of the JMP 14 header on the MFJ-1278 main board.



- Key paddle:
The cable for the key paddle must be a shielded two conductor plus a shield for ground. Use a 3.5 mm miniature stereo plug on one end of the cable. The other end of the cable is wired to the paddle, See figure below to wire your key paddle cable.



- **Speaker Connection:**

A monitor Speaker can be connected to the Speaker jack of the MFJ-1278. MFJ-280 Mobile Speaker is recommended. This is a side tone monitor for both the receiving and transmitting audio for all modes including CW side tone. It also served as a packet connect alarm. Use a mono or stereo 3.5 mm plug for this connection.

Caution: DO NOT feed audio from the radio through this Speaker jack. Use pin 4 of the Radio Port for audio input.

- **Printer Connection:**

The built-in Parallel Printer Port on the MFJ-1278 allows you to print text or pictures received without any special terminal program. If your terminal program does not support FAX or SSTV picture printing to the Computer screen, printing of these pictures are possible through this built-in printer port. An EPSON or IBM graphic compatible parallel printer is required.

The printer cable necessary to make this connection is a Standard IBM parallel printer cable. You may purchase this cable (MFJ-12) from MFJ Enterprises, Inc. or from your MFJ dealers.

5. After properly connecting the MFJ-1278 to the Computer and to your radio, you are ready to operate. Load the terminal program and make sure that the terminal program Parameters are set as described earlier.
6. Turn on the MFJ-1278. Press the "Return" key several times in succession. MFJ-1278 will sign-on with the display of sign-on messages and end with the cmd: command prompt.

II. BASIC OPERATION COMMANDS

The terminal program provided by the MFJ Starter Pack is designed to allow easier and faster ways to use your MFJ-1278. Some operational procedures given by the MFJ-1278 manual may be different from the procedure given by the documentation of the terminal program. In this case you should follow the procedure given by the terminal program documentation.

Most of the commands of the MFJ-1278 are defaulted to enable you to operate in any mode. However, before you start to use the MFJ-1278, you must first enter your callsign into the MFJ-1278 memory.

- To Enter Your Callsign:

Under cmd: prompt, type: MYCALL xxxxxx <CR> (xxxxxx is your call sign)

- To change operation mode:

Use the MODE command to change operation mode of the MFJ-1278.

The MODE command has the following form:

MODE *xx,bbbb,m*

where, *xx* is the operation mode, *bbbb* is the radio baud rate or speed and *m* is the modem selected to be used for that mode. In most cases you will not need to specify the modem (*m*) to be used. The defaulted modem will be matched to the mode of operation by the MFJ-1278 automatically.

Examples:

- a. To select CW mode at 13 wpm, you will type:

MODE CW,13<CR>

If no radio baud rate or modem are selected, MFJ-1278 will use the defaulted radio baud-rate/speed and modem.

- b. To select 300 baud HF packet, you will type:

MODE HP<CR>

MFJ-1278 will be set to operate 300 baud HP packet.

- c. To select 1200 baud VHF packet, you will type:

MODE VP,1200<CR>

MFJ-1278 will be set to operate 1200 baud packet.

- d. To enter SSTV mode, type:

MODE TV<CR>

MFJ-1278 will be set to operate SSTV in the 8.5 second format.

Abbreviation for all the MODEs are as follows:

MODE VP	for	VHF packet
MODE HP	for	HF packet
MODE VB	for	VHF RTTY
MODE HB	for	HF RTTY
MODE VA	for	VHF ASCII
MODE HA	for	HF ASCII
MODE CW	for	CW & Memory Keyer
MODE MC	for	Modulator CW
MODE FX	for	FAX
MODE TV	for	SSTV
MODE AM	for	AMTOR and NAVTEX

- o For a listing of the MODE abbreviation, type:

SET<CR>

- o To verify the present operation mode, type:

MODE<CR>

- o To change Radio port, type:

R 1<CR>	for radio port 1, or
R 2<CR>	for radio port 2.

For detail of Operation in each Operation mode, refer to Chapter 4 of the MFJ-12/8 main instruction manual.

III. TRANSMIT AUDIO LEVEL SETTING

Before you start to use the MFJ-1278, you must set the transmit audio level properly. Radio port 1 and Radio port 2 must be independently set.

A. VHF Radio Transmit Audio Level Setting:

1. Connect the radio to a dummy load and listen to the transmission with another radio nearby.
2. With the MFJ-1278 in the VHF packet (VP) mode and under the cmd: command prompt, type:
CALIBRA<CR>
3. Type K, then press the space bar for the higher of the two tones transmitted by the MFJ-1278. Note the MFJ-1278 will unkey itself after a few seconds. Re-key, if needed by pressing the K again to transmit.
4. The transmit audio level controls are located on the left side of the MFJ-1278. With a small screw driver turn the transmit control fully counter-clockwise (minimum).
5. Slowly turn it clockwise (increase) until no increase in audio output level is heard at the monitoring receiver.
6. Rotate the the control counter clockwise until the audio Signal on the monitoring receiver is reduced by half of the maximum level.
7. Type the K key to return to receive mode.
8. Type the Q key to exit the calibration routine.

B. HF Radio Transmit Audio Setting:

1. Connect the HF radio to a dummy load.
2. Set the HF radio controls as follows:
 - VOX: OFF
 - AGC: FAST
 - Speech Processor: OFF
 - Mode Selector: LSB
 - Meter Switch: Power Reading
 - Speaker Monitor: ON (if available)
 - Microphone Gain: 1/4 Turn
3. Under the cmd: command prompt, type:
CALIBRA<CR>
4. Type K, then press the space bar for the lower of the two tones transmitted by the MFJ-1278. Note the MFJ-1278 will unkey itself after a few seconds. Re-key, if needed by pressing the K again to transmit.

5. The transmit audio level controls are located on the left side of the MFJ-1278. With a small screw driver turn the transmit control fully counter-clockwise (minimum).
6. Slowly turn it clockwise (increase) until at a point where output power is slightly below the rated Output of your radio.
7. Type the K key to return to receive mode.
8. Type the Q key to exit the calibration routine.

IV. RECEIVER AUDIO SETTING

With your radio in the receive mode, open the squelch control so that a steady hiss is heard on the Speaker. Set the volume control to the minimum, then slowly increase it to a point that the MFJ-1278 tuning indicator move toward the middle of the display. This is the minimum volume from your receiver to allow the MFJ-1278 to copy. Continue to increase the volume control until the audio level is about twice the minimum level.

The DCD Threshold control needs to be set for proper Operation as well. While still listening to un-squelched receiver noise, rotate the DCD Threshold control on the MFJ-1278 clockwise until the DCD LED just flickers with false data carrier indications.

Note that DCD Threshold setting may vary for other modes of Operation. Follow the method of setting the DCD Threshold as described in the main instruction manual under each Operation mode.

V. MFJ-1278 2400 PACKET OPERATION

If your MFJ-1278 does not have the 2400 modem, an optional modem (MFJ-2400) can be purchased and installed. Installation is simple; your MFJ-1278 is equipped with all connectors necessary to make this Installation without modification or soldering.

With the 2400 modem installed, your MFJ-1278 is capable of operating 300, 1200 or 2400 baud packet. 300 baud and 1200 baud packet are not affected by the Installation of the 2400 modem.

The addition of the 2400 modem feature will in no way require any internal modification to your transceiver.

A. 2400 Packet Operation Setup

All default parameters set for 1200 packet operation can be used for the 2400 operation. 2400 operation needs no unusual setup or parameter changes. There are however, some changes that can be made later to the MFJ-1278 parameters which will enable you to improve the speed the throughput performance of the 2400 operation. The "honing" of the parameters may not seem like much, but we have found that at 2400, the MFJ-1278 seems to be more responsive to the TXDELAY, DWAIT, RESPONSE and SLOTTIMES. When using direct connects and good paths, the MAXFRAME and PACLEN commands can be increased to allow larger packets to be moved during each transmission. When returning to the active thru-put frequencies, these two commands should be reduced to their original settings. You may find that if you were using a TXD of 50, then a TXD of 40 will now perform better. The DWAIT can be shortened or lengthened to suit the AGC recovery time of your radio. For instance, if you have been running the DWAIT of 16, it may now perform better at DWAIT of 12 or even 10. The FRACK will appear to exercise more at 2400.

2400 really shows its place in the packet world when used to pass large ASCII, BINARY and PICTURE files. It is always good to use clear frequency and/or use direct connects to the target station rather than going thru a node or digipeater. The reason is obvious. There are few 2400 nodes at the present time. However, it should be pointed out that implementation of a 2400 node is just as easy as building and using a 1200 node.

To select 2400 packet operation, under the CMD: command prompt, type:

```
MODE VP,2400
```

MFJ-1278 will be set to 2400 packet operation. TURBO LED will light. 2400 packet can be operated with Radio Port 1 or Radio Port 2 on the MFJ-1278. Note that if your MFJ-1278 is not equipped with the 2400 modem, TURBO LED will not function and you will not be able to operate 2400 packet.

B. Receive Audio Setting

The MFJ 2400 modem employs automatic gain control (AGC) for its receive audio. The receive audio level is preset for proper 2400 operation; no adjustment is necessary in most cases. If you set the receive audio of your radio properly for 1200 operation, then it will be suitable for the 2400 operation also. No adjustment for the receiver audio on the 2400 modem board is needed.

C. Transmit Audio Setting

Transmit audio on the 2400 board is set by adjusting R38 (next to T2) on the 2400 modem board. Transmit audio for the 1278T is preset at the factory to match the audio level of the 1200 modem on the MFJ-1278 mother board. Once the 1200 and the 2400 transmit audio are set to the same level, then you may adjust the audio level going into your radio by using the "Transmit Audio" controls on the left side of the MFJ-1278. Note that these controls set the transmit audio levels for all the Operation modes of the MFJ-1278, including the 2400 packet operation.

When adjusting the transmit audio level please note that the range of R38 is preset by CN-6 header. The shorting jumper on CN-6 header sets range as follows:

CN-6 Jumper Position	Transmit Audio Range (no load)
no jumper	50 mV - 60 mV p-p
1 & 2 (default)	100 mV - 200 mV p-p
2 & 3	250 mV - 3 V p-p

VI. AUTOMATIC SIGNAL ANALYSIS (ASA)

The latest firmware (Release 3.4) is installed in your MFJ-1278. A major feature, Automatic Signal Analysis (ASA) is installed in this firmware release. ASA can analyze received Signals such as RTTY, ASCII, AMTOR and HF Packet. It will tell you the speed, data bits and whether or not the Signal is inverted. ASA automatically switches the MFJ-1278 to the correct mode once you accept the results of the signal analysis by typing OK and <CR>. As you see ASA is extremely helpful when tuning across the Amateur or the Short wave bands. Let ASA help you determine what kind of Signals you are listening to.

AUTOMATIC SIGNAL ANALYSIS (ASA) OPERATION

ASA is effective in analyzing RTTY, ASCII, AMTOR and HF Packet. Once invoked, ASA only takes a few seconds to analysis the tuned-in signal. Once the result is displayed, user can decide whether to accept by issuing the OK command or refuse the result by entering ASA again. Once accepted, ASA will switch to the mode it displayed, enter Converse mode automatically and display data on the screen.

To produce the most accurate result, the MFJ-127S should be set to the HB, HP or HV mode prior to enter ASA mode. Enter one of these mode by using the MODE command. For example, at cmd: prompt, type:

Mode HB<CR>

Then at the cmd: command prompt, enter ASA mode by typing:

ASA<CR>

After a few seconds ASA displays the speed and the confidence factor then it follows with a pause. After a 5 to 10 seconds pause it will display the speed, data bits and the setting of RXInvert (On or Off). This is what ASA will switch the MFJ-1278 to, if the user accepted its result.

The display is in the following format:

<Speed><Confidence Factor>.<Speed><Data Bits><RXInvert On/Off>

A typical result will look like this:

80 baud 90% Confidence. 75 baud 7 bits RXInvert Off

After the result is displayed, MFJ-1278 will return to the cmd: command prompt. At this point you can analysis another signal by typing ASA and press "Return", or if you agreed with the results then enter:

OK<CR>

The MFJ-1278 will switch to the analyzed mode, display the mode status and enter "Converse" mode ready to receive data.

In the case of analyzing a 300 baud signal, the MFJ-1278 will prompt the user that the signal could be packet. If this occurs then the user can enter the following command from the cmd: prompt:

OK Packet<CR>

MFJ-1278 will switch to 300 baud HF packet.

If the user does not issue the OK Packet command and issues just the OK command because you know that the signal is not packet, then the MFJ-1278 will switch to 300 baud RTTY. You will enter converse mode by typing "K" at the cmd: prompt and MFJ-1278 begin to copy the signal.

If the ASA result is a 100 baud signal, the MFJ-1278 will prompt the user that the signal could be AMTOR. If this occurs then the user can enter the following from the cmd: command prompt:

OK AMTOR<CR>

When the "OK AMTOR" command is given the MFJ-1278 will switch the AMTOR mode. Follow the AMTOR operating procedure to go to any of the AMTOR modes.

If the user does not issue the "OK AMTOR" command the MFJ-1278 will switch to 100 baud RTTY.

Note that if RTTY or ASCII signals are analyzed, and the MFJ-1278 not copying the signal correctly. The signal may be encrypted with bit inversion. Most of the time two or three bits of the RTTY character may be inverted. If the baud rate and the type of signal have been determined, you may want to try to use the RBitmask command to set varies inversion pattern to match the receive signal. Manual setting of the RBitmask command is not necessary. The RBitmask command can be invoked when the MFJ-1278 is in the RTTY or ASCII receive mode by simply issue the "CTRL-U". Once "CTRL-U" is issued, MFJ-1278 will automatically cycle thru the 32 possible combinations bit inversion pattern and try to match the encrypted signal. If a match can be found, MFJ-1278 will precede to copy the signal.

Note that when using ASA, noise will have major effect on the degree effectiveness for ASA.

V. COMMAND UPDATE

The following commands have been added since the printing of the MFJ-1278 4th Edition Instruction Manual.

ASA Mode: Packet/ASCII/RTTY/AMTOR

ASA is an immediate command. When invoked the MFJ-1278 will analyze incoming Signals such as RTTY, ASCII, AMTOR and HF packet. It will display the result for speed, data bits and whether or not the signal is inverted.

When invoked and the MFJ-1278 has analyzed the incoming signal a message will be generated in the following format:

<Speed> <Confidence Factor>. <Data Bit> <RXInvert On/Off>

ASA will be used in conjunction with the OK command.

Once user accepted the results given by the ASA, MFJ-1278 will select the appreciate modem, match the data rate, set the RXInvert and ready to receive the signal.

ASA is not effective in analyzing FAX, SSTV, CW signals and noise.

OK Mode: ASA

OK is an immediate command when used in conjunction with the ASA command.

When the results are displayed when using the ASA mode, the user can issue the OK command to accept the results analyzed by ASA.

Typing OK will cause the MFJ-1278 to selected the Operation mode and match the speed automatically against the signal being analyzed.

RXBRRIGHT n Mode: FAX/SSTV Default: $n = 4$

Parameter:

when $n = 0$, RXBRight assumes the current values of TVBreak.
 when $n = 1$ to 9, RXBRight assumes the following TVB values:

n	TVBreak
0	assumes the current values of TVBreak
1	\$42, \$26, \$28, \$2A, \$2C, \$2F, \$32, \$35
2	\$42, \$27, \$29, \$2B, \$2D, \$30, \$33, \$36
3	\$42, \$27, \$29, \$2B, \$2E, \$31, \$34, \$37
4	\$42, \$28, \$29, \$2C, \$2F, \$32, \$35, \$38
5	\$42, \$28, \$2A, \$2D, \$30, \$33, \$36, \$39
6	\$42, \$28, \$2B, \$2E, \$31, \$34, \$37, \$3A
7	\$42, \$29, \$2C, \$2F, \$32, \$35, \$38, \$3A
8	\$42, \$2A, \$2D, \$30, \$33, \$36, \$38, \$3A
9	\$42, \$2C, \$2E, \$31, \$34, \$37, \$39, \$3A

Note the larger n is the brighter the picture. The defaults TVBreak default values are:

TVB \$42, \$27, \$28, \$2A, \$2B, \$2D, \$2F, \$30

TXBRRIGHT n Mode: FAX/SSTV Default $n = 4$

Parameter:

When $n = 0$, TXBRight assumes the current PIXtones values.
 When $n = 1$ to 9, TXBRight assumes PIXtones values as follows:

n	PIXtones
0	assumes the current PIXtones values
1	\$BC, \$98, \$A8, \$88, \$B0, \$90, \$A0, \$80
2	\$BA, \$B8, \$A8, \$88, \$B0, \$90, \$A0, \$80
3	\$B9, \$BA, \$B8, \$A8, \$B0, \$90, \$A0, \$80
4	\$BB, \$B9, \$BA, \$B8, \$A8, \$B0, \$A0, \$80
5	\$BF, \$BD, \$BE, \$BC, \$98, \$88, \$90, \$80
6	\$BF, \$BB, \$B9, \$BA, \$B8, \$A8, \$B0, \$A0
7	\$BF, \$BB, \$BD, \$BE, \$BC, \$98, \$88, \$90
8	\$BF, \$BB, \$BD, \$B9, \$BA, \$B8, \$A8, \$B0
9	\$BF, \$BB, \$BD, \$B9, \$BE, \$BC, \$98, \$88

Note that the larger n is, the brighter the default picture. The PIXTONEs values are:

PIXtones \$B9, \$BA, \$B8, \$98, \$88, \$B0, \$90, \$A0

TXDIDDLE ON/OFF Mode: Packet Default: ON

TXDIDDLE is whether or not the MFJ-1278 uses a highly efficient square wave signal in place of flags during the transmitter delay (TXDELAY) period. When TXDIDDLE is ON, you may select even smaller TXDELAY intervals because the square wave presents four times as many transitions as TXDIDDLE OFF does for your connectees' receive synchronization.

TXDIDDLE is defaulted to the ON setting to reflect the increased efficiency. However there are a number of TNCs on the market which purport to be AX.25 compatible but do not recognize valid AX.25 packets preceded by the TXDIDDLE keyup technique. You may recognize the need to set TXDIDDLE OFF if it appears that the Station you're working is unable to successfully receive your packets despite your adequate signal.

This failure of some TNCs to receive TXDIDDLEd packets may be a result of some Software carrier-detect schemes. All TAPR and derivative TNCs utilizing hardware-generated carrier-detect receive both TXDIDDLEd and non-TXDIDDLEd packets with equal efficiency.

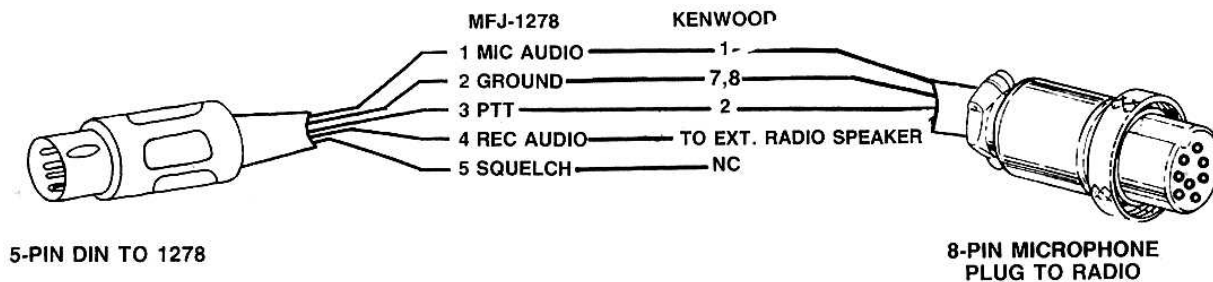
Note that when TXDIDDLE is OFF, TXDELAYC is irrelevant! Therefore, the actual TXDELAY yielded when TXDIDDLE is OFF is equal to $\text{TXDELAY} \times 100 \text{ ms}$ plus any AXDELAY time.

VII. RADIO CABLE WIRING DIAGRAMS

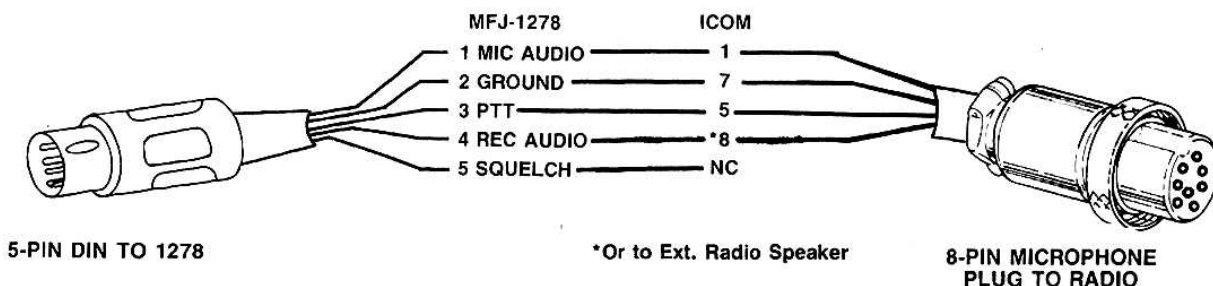
The radio connection information listed in this section is believed to be accurate. However, you should check the accuracy of this information with the instruction manual of your radio. MFJ Enterprises, Inc. is not responsible for any inaccuracy of the information provided by the diagrams and charts in this instruction manual.

Some optional pre-assembled cables to connect the MFJ-1278 to some radios are available. Contact MFJ dealer or MFJ Enterprises, Inc. for detail concerning these cables.

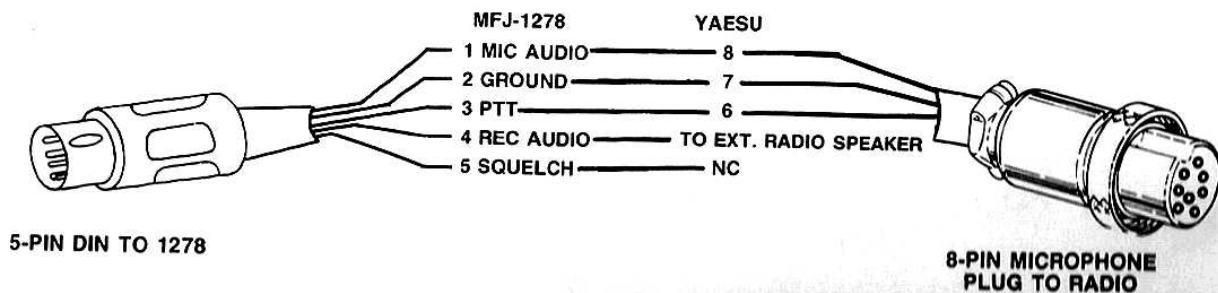
A. 8-pin Microphone Connector:



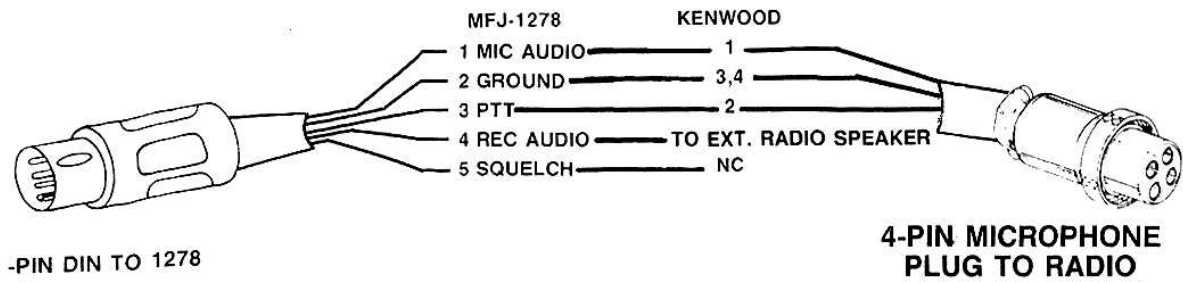
o ICOM:



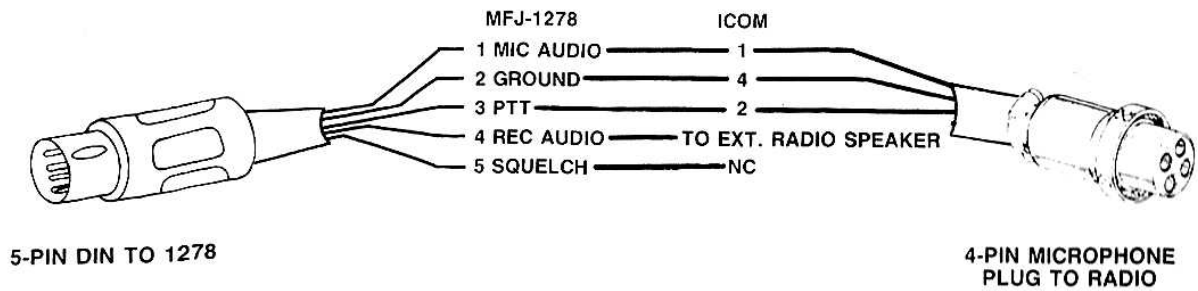
o Yaesu:



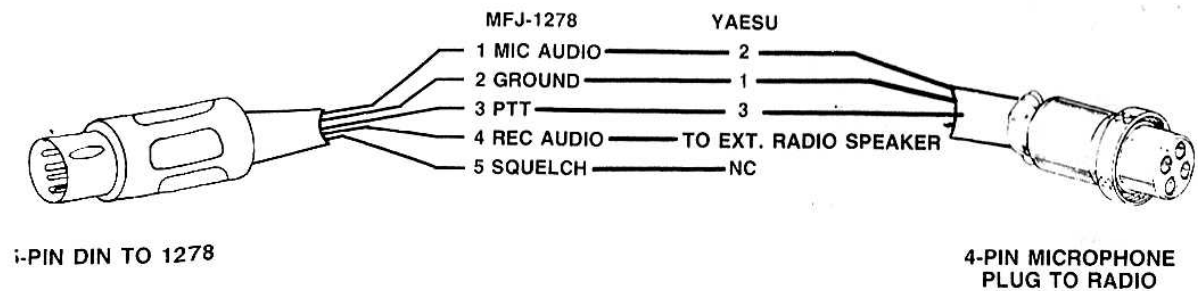
B. 4-pin Microphone Connector



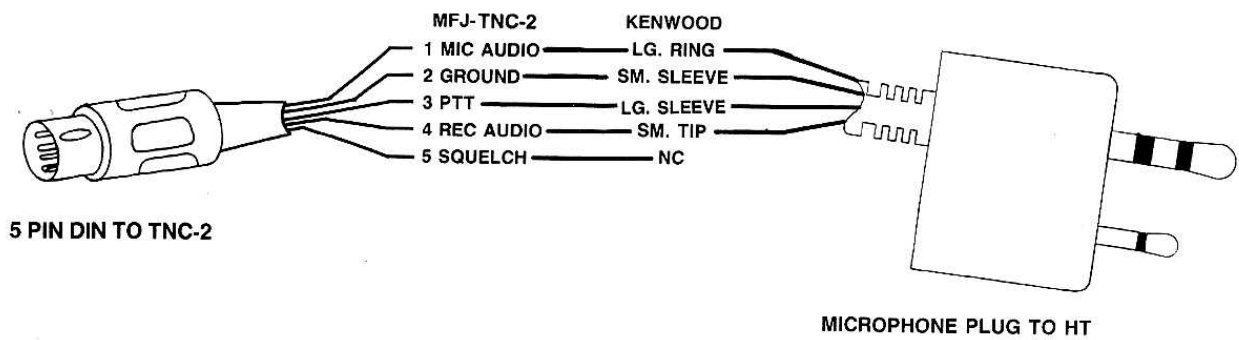
o ICOM:



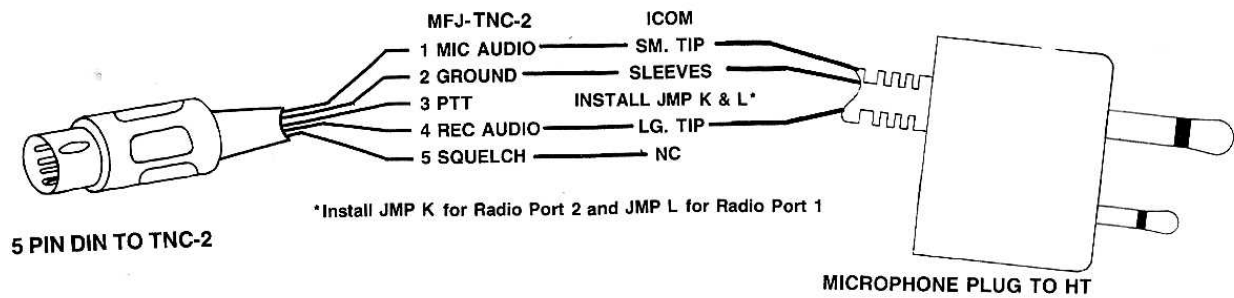
o Yaesu:



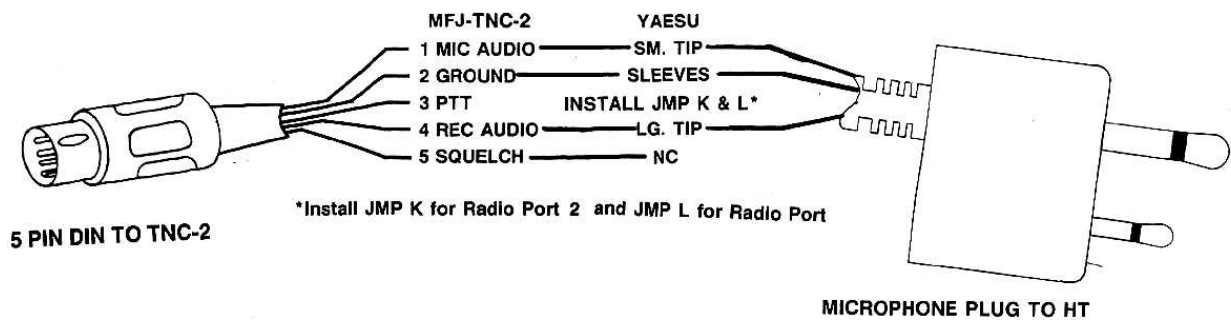
C. Handheld Radio Connectors:



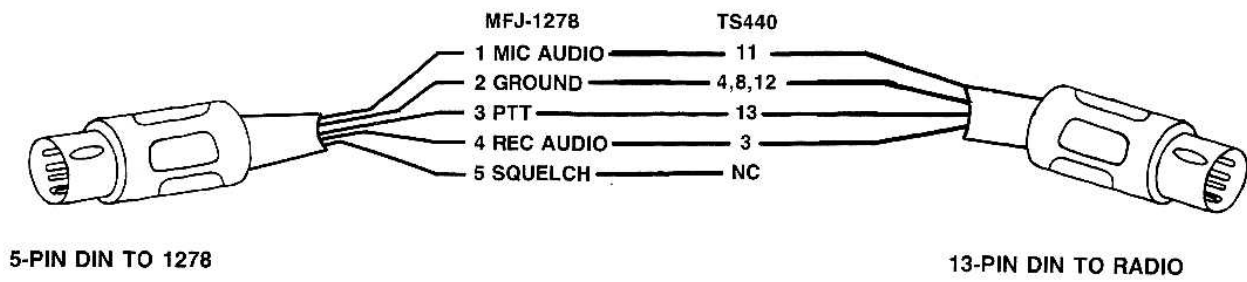
o ICOM: All models



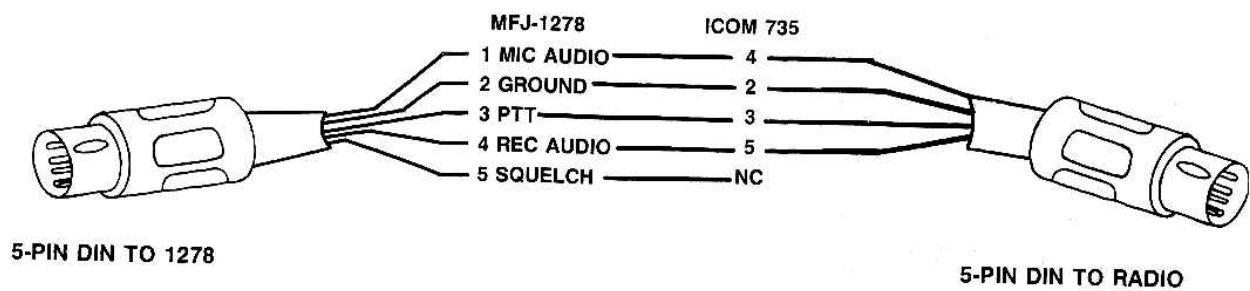
o Yaesu: FT-x09, FT-x3, FT-727, FT-470, FT-X11 and other models which are pin compatible with these radios.



D. Using the Accessory Jack



- o ICOM: IC-735 (ACC 1)



E. Hookup for Specific Radios

MFGS. OR RADIO	CONNECTOR TYPE	MIC. AUDIO To pin 1 of 1278	PTT To pin 3 of 1278	RX AUDIO To pin 4 of 1278	GROUND To pin 2 of 1278
<u>KENWOOD</u>	4 pin 5 pin 6 pin 8 pin	pin 1 pin 1 pin 1 pin1	pin 2 pin 2 pin 2 pin 2	Speaker Speaker Speaker Speaker	pin 3, 4 pin 4, 5 pin 6 pin 7, 8
TR-2500	HTs	Tip-Lg.	Sleeve-Lg.	Tip-Sm.	Sleeve-Sm.
TR-x600	HTs	Ring-Lg.	Sleeve-Lg.	Tip-Sm.	Sleeve-Sm.
TH-x1xx	"	"	"	"	"
TH-x15	"	"	"	"	"
TH-x5	"	"	"	"	"
<u>ICOM</u>	4 pin 8 pin HTs*	pin 1 pin 1 Tip-Sm.	pin 2 pin 5 Tip-Sm.	Speaker Speaker or pin 8 Tip-Lg.	pin 4 pin 6, 7 Sleeves
<u>YAESU</u>	4 pin 8 pin	pin 2 pin 8	pin 3 pin 6	Speaker Speaker	pin 1 pin 7
FT-208	HTs	pin 1	pin 3	pin 2	pin 4
FT-x09	HTs*	Tip Sm.	Tip-Sm.	Tip-Lg.	Sleeves
FT-x3	HTs*	"	"	"	"
FT-727	HTs*	"	"	"	"

*: Some ICOM and Yaesu HTs key the transmitter by completing the ground connection on the microphone. If your HT is one that is noted in the above chart, you must follow the instruction given in Chapter 3 of the MFJ-1278 instruction manual.

NOTE: The radio connection information listed in this section is believed to be accurate. However, you should check the accuracy of this information with the instruction manual of your radio. MFJ Enterprises, Inc. is not responsible for any inaccuracy of the information listed in the above chart.