PACKET USER'S NOTEBOOK

CONNECTING YOU AND PACKET RADIO IN THE REAL WORLD

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For That Quantum Leap—The Alinco DR-150T TNC

Packet radio has propelled amateur radio into the era of computers with a quantum leap. Because of this rapid move into the world of digital communications, there are many new amateurs entering the hobby for the purpose of using the digital modes that make use of the computer and associated software.

With the quantum leap comes the need for faster data rates. This need in turn drives the requirement for broader receiver IF and faster switching (transmit push-to-talk to full power output) transceivers. As a result of these requirements, many packeteers are looking into transceivers that will provide both voice operation and high-speed packet use.

If you are looking for a transceiver to access the local voice repeater and one which will handle the large variety of packet applications that exist—including keyboard-to-keyboard networks, switches, nodes, DX spotting nets, BBSes, conference clusters—you can find that happy balance in the Alinco DR-150T.

With some of the packet applications I've just mentioned the user can connect to distant stations in other cities, states, and countries using a medium-power transceiver. There is no need for super-power transceivers that run hundreds of watts. The power level of the Alinco DR-150T allows the user to select the power needed to make the connect or contact ranging from 10 to 50 watts output. This Alinco transceiver was designed with the packeteer in mind.

The Best Is Yet To Come

The DR-150T is engineered to provide optimum audio characteristics for the Mark and Space tones of 1200 and 2200 Hz (1200 baud). In addition, the DR-150T has been engineered to transmit and receive 9600 baud. Thus, it can be used with both 1200 and 9600 baud TNCs.

Although it is not a requirement, one of the desired features in a data radio is the time period between when the TNC activates PTT and the level at which the transmitter reaches full output power. This is called TXDelay. Ideally, a 50 watt, 9600 baud transceiver should have a TXDelay of 20 or less. A TXDelay of 20 equates to 200 milliseconds, or one fifth of a second from the time the Push-To-Talk (PTT) is activated until the transceiver reaches the full 50 watts of output power. At full output (or the TXD setting) the TNC applies the data stream to the transmit FSK or AFSK line (transceiver data input).

As a matter of interest, I've found that the DR-150T performs as well in 9600 baud packet operation as it does with voice applications. To give you a better understanding of what you can expect from the Alinco DR-150T, I've included the specifications in Table I.

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The Alinco DR-150T TNC.

Interfacing Your TNC To The Alinco DR-150T

Twelve-hundred baud mic pin connections for the Alinco DR-150T I/O are shown in Table II (also see fig. 1).

Interfacing the DR-150T to a 9600 baud TNC is somewhat different from the way in which we connect the DR-150T to a 1200 baud TNC. In fig. 2 I've illustrated the back panel of the DR-150T to provide a detailed look at the two jacks. Notice the 9600 baud data jack is a 2.5 millimeter "stereo" jack, while the external speaker jack is a 3.5 millimeter mono jack. The 3.5 mm jacks are often called a "1/8 inch" jack (or plug). The 3.5 mm plugs are easy to locate at any Radio Shack store. You may soon discover the 2.5 mm "stereo" plug is a different story.

To circumvent this problem I made up the interface cable using a 3.5 mm stereo plug on the Tx/Rx connection. I purchased a 3.5 mm to 2.5 mm adapter to complete the connection to the DR-150T 9600 baud data jack. The adapter is available from Radio Shack as part

SPECIFICATIONS OF THE ALINCO DR-150T

GENERAL	
Frequency coverage	Tx = 144.000–147.995 MHz Rx = 108.000–173.995 MHz Rx = 440.000–449.995 MHz
Antenna Impedance	50 ohms unbalanced
Power requirements	13.8 volts DC
Receive current	0.6 ampere (approx.)
Transmit current	10 ampere (approx.)
Dimensions	(not defined in US standard)
Weight	(not defined in US standard)
TRANSMITTER	
Output Power	High = 50, Medium = 25, Low = 10
Emission Mode	16F3
Modulation Type	Reactance (true FM)
Maximum Frequency Deviation	±5 kHz
Spurious Emission	Not more than –60 dB
RECEIVER	
Receiver Type	Dual Conversion, Super Het.
Modulation Acceptance	16F3, F2, F3
Intermediate Frequency	45.1 MHz and 455 kHz
Sensitivity (12 dB SINAD)	2 m band better than 0.16 uV
Sensitivity (12 dB SINAD)	70 cm band better than 0.10 uV
Selectivity	12 kHz => @ –6 dB; =<28 kHz @ –60 dB
Audio Frequency Output	1.5 watts into 8 ohm speaker

Table I– Specifications of the Alinco DR-150T dataradio.

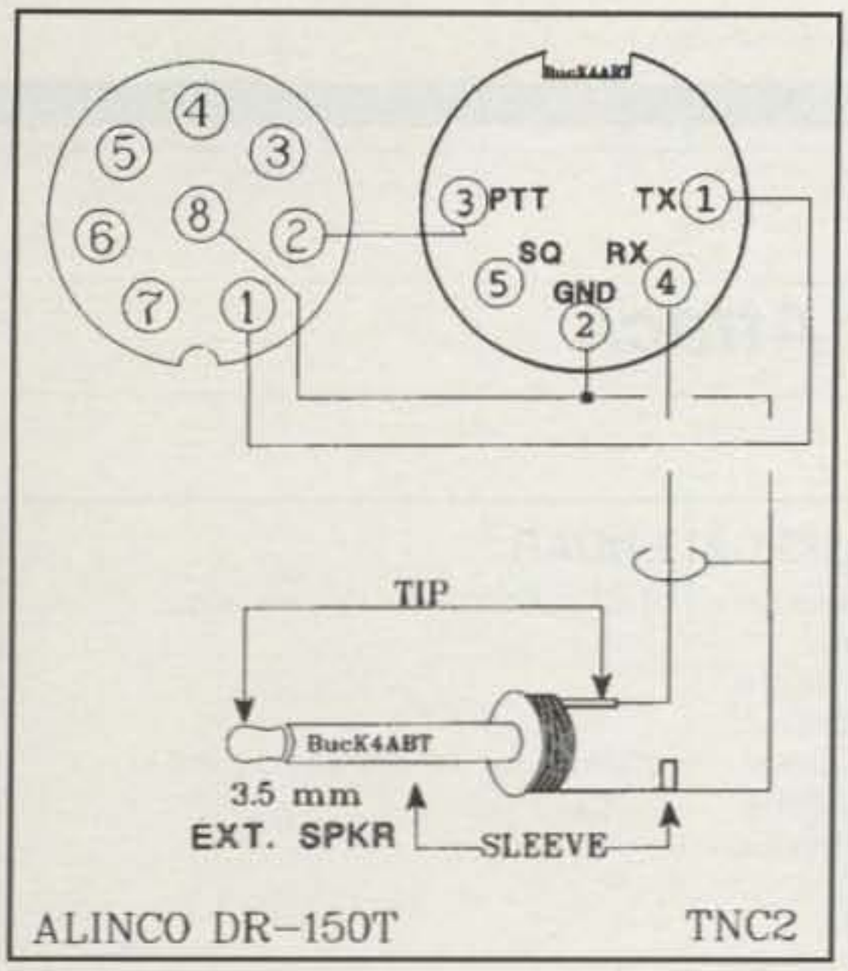

Fig. 1– Interfacing the Alinco DR-150T transceiver to a TNC-2. (See also Table II.)

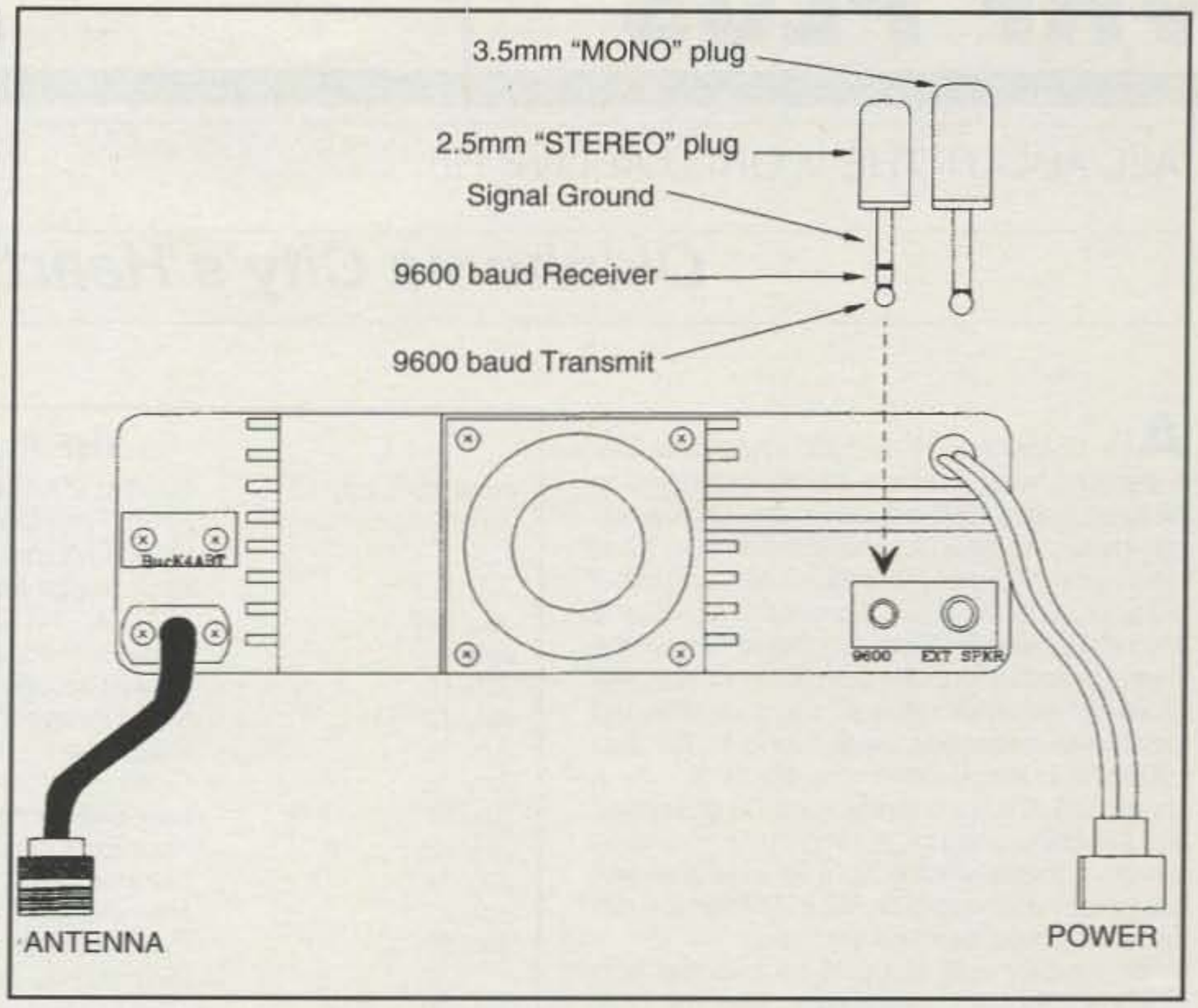

Fig. 2– The 2.5 mm stereo plug is used as the input/output for 9600 baud. The 3.5 mm plug is used to extract receive audio for 1200 baud only.

number 274-373. The description on the Radio Shack blister pack is "Headphone Adapter"—adapts 3.5 mm (1/8 inch) to 2.5 mm (3/32 inch) jacks.

Before beginning the interface and setup procedures which we will discuss in the next portion of this month's column, I recommend that you read page 63 of the DR-150T manual. Reading the complete manual will allow you to familiarize yourself with the transceiver and will provide information for the 9600 baud configuration. The DR-150T manual is a virtual storehouse of information that applies to your new DR-150T voice and data radio. Best of all, you will discover hundreds of wonderful features that are programmed into the microprocessor of the DR-150T.

Transmitting Packet

To operate a packet station you should have a current amateur radio license that allows operating privileges within the spectrum to which your DR-150T is tuned.

If the interface cables are properly wired and connected, then you are ready to establish contact with another packet station. It is wise to solicit help of another person who is already operating in the packet modes, especially when operating at 9600 baud. In this way you will have someone who can listen for your signal and direct you to the operating frequencies that are set aside for 9600 and/or 1200 baud packet.

Although the DR-150T is engineered to make use of limiting circuits that are designed to prevent over-modulation (deviation), there are some TNCs which may drive the transmit audio circuitry too hard. An indication that a problem such as this is present would be noticed when a connect is tried to a nearby packet station with no results. Often too much transmit deviation can cause the same problem as not enough transmit audio. I've found

1200 BAUD MIC PIN CONNECTIONS

PIN (mic connector)	TNC FUNCTION
1	AFSK Output
2	PTT Control
6	RECEIVE Audio
7	Shield/Ground
8	PTT Ground

Table II– Microphone pin connections for the Alinco DR-150T I/O, 1200 baud (also see fig. 1). Note: If hum or noise is experienced on the transmitted packet signal, disconnect the shield connection at the TNC end of the cable. The gray wire at pin 8 will provide ground return for the PTT line; therefore no additional ground wires are necessary.

the best transmit audio level setting for either 1200 or 9600 baud is in the range of 3.0 to 3.5 kHz (swing). Without exception, all TNCs have provisions within their circuitry that enable users to increase or decrease the level(s) when necessary. It is advisable to know which component inside or outside the TNC controls the TNC audio output. It may be necessary to make an adjustment to the associated level control(s). *Remember:* This is the exception, not the rule, with 1200 baud. However, the level setting for 9600 baud transmit audio is less forgiving. Until you experience packet at 9600 baud, you don't know what you are missing. Once you have achieved the proper setting for 9600 baud, the rest is pure pleasure.

For more information concerning the Alinco DR-150T, contact Alinco Electronics Inc., 438 Amapola Ave., Unit 130, Torrance, CA 90501 (phone 310-618-8616; FAX 310-618-8758).

Happy Packeting!

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