O P Q R S T U V W X Y Z

Because the terms, and jargon used when "talking" Packet is not yet broken into a group of buzz-words, the new (and seasoned veteran) user may find it best to learn some of the English language descriptions that are used in place of single word identifiers.

The need for a place to start is the question of every prospective packet user. There are two basic requirements that are placed on the beginner as a form of constraint.
The first need of the newcomer is an understanding of the jargon or buzz-words and terms associated with packet radio. The second need is directly related to the "how do we put a system together"?

Through many years experience as the Manager of Engineering for a large network of television and radio broadcast stations, I learned this very important lesson. By first allowing the prospective technician or engineer a few months of "on-the-job-training," and later sending them to school, he or she would return to the work place with a higher grade average than those who had not first been exposed to the "practical" work environment.

To these ends and in that same manner, I wish to address this glossary. I will first give a synopsis of the packet station requirements and configuration procedures. Later we will study the single word, or letter groups that are called; "acronyms and mnemonics." Here is what I hope we will achieve; When you read this section, you will begin to learn about Packet in a new way, and with more understanding. The rest of the learning process is easy because the nature of Packet is one that allows "learning by osmosis."

After completing this addendum, you will have a better understanding of the dialog of Packet Radio, and of the terms used throughout this book.
You will discover that you have developed a more fluent understanding of the packet radio and the terms associated with your "hobby". In addition, you will be able to put your packet station on the air with less difficulty than those who have not studied this kind of material.

You will become the expert of packet "jargon" in a very short time. The added benefit, is an increased knowledge about the subject, and you will be on the air with the best of us who enjoy the most advanced communications mode to date.

A

AAR

Automatic Alternate Routing.

ABAUD (In some terminal node controllers is called "TBAUD")

Data speed between the computer terminal and the TNC.

ABSOLUTE DELAY

The actual time taken for a signal to transit a Packet signal from end to end; affected by the actual circuit length and the "propagation constants" of the type of medium used.

ACK

Acknowledgment from target Packet station receiving an error-free Packet from the station which sent the original Packet of information. The "acknowledge" character in many data codes, used most commonly for an affirmative response of correct receipt. The "ACK" lets the sending station know if it should send another packet, or resend a missed or "nack" (defective) Packet. ACK is used most commonly for an affirmative response of correct receipt. (Compare to NACK).

ADAPTIVE ROUTING

In data networks, routing algorithms capable of adjusting message routes in response to changes in traffic patterns or transmission channel failures. eg; Alternate routes in the X-1J/X2 nodes.

ADDRESS

In Packet Radio networks, the distinct identifier of a destination node or station.

AEA

Advanced Electronics Applications Inc. AEA designs, manufactures and markets a wide range of amateur packet products as well as other amateur related items. The AEA products are now marketed by "TIMEWAVE" corp.

AFSK

Audio Frequency-Shift Keying. A method of digital modulation. This is a mechanism for sending digital information over a radio. A signal 0 (zero) is sent using one tone while the signal 1 (one) is sent using a different tone.

This is the mechanism used by telephone modems and packet radio modems. When associated with VHF Packet, the audio frequency-shift is usually 1000 Hz. A 0 (zero) is one tone while a 1 (one) is a different tone.

AFT

Amateur Framing Technique. This is the protocol used by ROSE switches on an RS-232 LAN.

ALGORITHM

a prescribed set of steps that implement a function or task; a mathematical solution.

ALIAS

The "alias" is normally used to identify the location of a digipeater. Many "nodes" are given the local airport identifier or the abbreviation for the city or state of origin.ie; The alias of Lynchburg, Virginia SEDAN node is "LVA."

The "alias" also eliminates the need to type in long call signs and SSID.

ALOHA NET

An early (1975) packet radio experiment conducted by the University of Hawaii. The Aloha net is known for it's performance definitions for packet systems which have hidden transmitters.

ALTERNATE ROUTE

A secondary communications path used to reach a destination if the primary path is unavailable

ALTERNATE USE

The ability to use communications transmission facilities for multiple applications - voice or data being the most common example.

AMBIENT NOISE

Constant noise present in all forms of telecommunications paths; a condition that most Packet communications networks operate with.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) br

Official repository of standards for the United States of America.

Example: ASCII data communications code is ANSI C.64 and CCITT International

Telegraph Alphabet Number 5, with only the smallest variation in a few definitions.

AMERICAN WIRE GAUGE (AWG)

Descriptive of the diameter of wire conductors, particularly in twisted pair cabling; has effect on the transmission capacity and distance a given wire can offer.

AMPLITUDE

Magnitude or size; voltage or power of an electronic signal.

AMPLITUDE MODULATION (AM)

Modifying a "carrier" signal by varying its instantaneous power to represent the information it carries; most commonly called "AM."

AMRAD

Amateur radio Research And Development corporation, is a non-profit group based in Virginia that has promoted many of the present day guidelines and practices that affect Packet Radio. AMRAD is one of the first organizations that was established to advance Packet Radio communications.

AMTEX

AMtor TEXt. A bulletin broadcasting system used by AMTOR bulletin stations like W1AW. Similar to the US Coast Guard NAVTEX system of naval advisories.

AMTOR

AMateur Teleprinting Over Radio. An improved method of RTTY that uses some forms of error recognition and correction to improve copy. Sort of a very simple basic form of packet using 3 character groups. AMTOR uses a limited character set (Capitol letters, numbers and a couple of controls like CR/LF similar to the Baudot set). AMTOR is normally used on HF frequencies.

AMTOR is modeled on a commercial protocol called SITOR. (See ARQ, FEC, SITOR, FACTOR, RTTY, Baudot)

ANALOG SIGNAL

A signal in a form that varies in step with the actual transmitted information. The retransmitted analog signal is not always an exact replica of the input.

ANALOG TRANSMISSION

Communications by transmission of continuously varying representations of the input signal, as compared to coded words in digital transmission.

ANSI

American National Standards Institute. A US organization that sets standards for almost any manmade tangible item .. from horseshoes to hand-grenades.

E.g. nuts, bolts, tires, computers...etc. (See ISO)

APLink

Amtor Packet Link. An AMTOR BBS program written by Vic W5SMM and used on an IBM PC to operate an AMTOR mailbox and gateway between the packet BBS network and international

AMTOR links.

APPLICATION LAYER

The topmost, visible to the user, presentation of a communications network; the user level of Packet Radio (AX.25) is Level 2.

ARPA SUITE

The set of protocols standardized by the Advanced Research Projects Agency of the US Dept. of Defense. Includes TCP and IP as elements, but leaves the lower levels (subnetwork and down) deliberately unspecified. The ARPA suite can be run on top of multiple subnet- works, concentrating them into a single Internet.

ARQ

Telegraphic code signal for "Automatic Repeat Request," a time-honored method of telegraphic error correction upon which most data transmission error correction is based. An error correction technique in AMTOR where the receiving station sends 1 character ACK/NAK response to each AMTOR group sent. (See AMTOR, ACK, NAK, FEC, handshalzing). ARQ receivers check for errors and initiate an order to retransmit data blocks determined to be corrupted in transmission.

ASCII

American Standard Code for Information Interchange. The ASCII 7 bit code with an eighth parity bit for error checking, it represents 128 characters, including 32 control characters. The most common code used for asynchronous data transmission by minicomputers and personal computers.

Also known as the ANSI standard X3.4 1977. The ASCII code set is used in almost all computers and the peripherals. ASCII is the basis of most information which is transmitted by amateur packet stations.

ASLIP

Asynchronous Serial Line Protocol (usually just called SLIP). A technique for encoding IP datagrams so they can be sent across ordinary asynchronous modems and communications hardware.

ASR

Telegraphic name for an "Automatic Send/Receive" terminal station, typically one that has storage for outbound messages and holds them until called upon by the communications network to send. Compare to "TNC or DIGIPEATER."

ASYNCHRONOUS

Occurring without central control or in an unpredictable time interval between successive elements; the typical mode of telegraphy, minicomputers and personal computers; requires s transmission of "start" and "stop" bits to provide decoding synchronization at the receiver.

ATTENUATION

Term denoting a decrease in power between that transmitted and that received due to loss through equipment, lines, or other transmission devices. Usually expressed as a ratio in dB (decibels). - Synonym: Loss; Antonym: Gain

AUDIT TRAIL

The list of headers (R: lines) attached to every BBS message that is used to trace the path the message assumed from its originating BBS.

AUTOMATIC ALTERNATE ROUTING (AAR)

Provision or function in a network to obtain a connection via secondary routes between two locations without need for user intervention. Compare to TheNET X-1J4 nodes.

AUTOFORWARD

Many bulletin board and mail server programs (BBS) are capable of passing messages to each other. The process of a bulletin board recognizing that it has mail to go to another bulletin board, connecting to another board and then sending the traffic is called Autoforwarding. This allows packet users to send mail in a non real time fashion anywhere on the planet where compatible Packet BBSs exists.

AUTOMATIC ANSWER

A function providing for a transmission control unit or station to automatically detect a connection and responding with a preset line of "connect text". Most commonly associated with personal mailboxes within the firmware of the TNC for Packet Radio use.

AUTOMATIC BAUD RATE DETECTION (AUTOBAUD)

A function of data TDM's (See "Time Division Multiplex") to sense and self-adjust to the data rate of connections made to one of the TDM's ports.

Typically used in modern MoDems and when initializing many Packet Radio TNC for the first time.

AUTOMATIC ROUTE OPTIMIZATION

In some Packet radio systems, this feature may denote added ability to adjust routing depending on traffic load or time of day. Some route adjustments may be accomplished by the System Node Operator (SNO) by locking routes to neighbor nodes at a higher quality number than that set in the nodes third parameter.

AUTOMATIC ROUTING

A means of internode data and traffic positioning through several network nodes that enables the fastest usable routing. This routing is usually determined by the node, however the node system operator may influence the routing by installing fixed or locked nodes and/or routes.

AUTOMATIC TRUNK

A node connection whose destination is predetermined by the node sysop. Most commonly used feature of the X-1J4 TheNET firmware. This enables or initiates a connect to a programmed destination node.

AX.25

The user level of Packet Radio (AX.25) is Level 2. The protocol or data "envelope" set aside for use in Amateur Packet Radio. The envelope contains the callsign of the originating station, the callsign of the target Packet station, synchronizing, addressing, control and error-checking characters.

It is transmitted as a single "frame" and designated as an AX.25 Packet. AX.25 amateur packet radio link level protocol that borrows the link layer from X.25 (also known as "LAPB"), modifies it, and tacks a datagram-style address/routing header on front

B

BACKBONE
A backbone is a system of links where nodes may communicate without interfering with or being interfered with by local access, and where data may be passed in a fashion and with hardware that is optimized for passing data, rather than optimized for user stations.

BACKBONE FACILITIES
A transmission facility designed to interconnect tributary facilities from clusters of dispersed users or nodes. A "backbone" can range from a single network like the SouthEast Digital Association Networks (SEDAN) to an intercontinental Packet Radio network.

BALUN
A form of impedance-matching transformer primarily to match radio antennas to unbalanced coax.

BAND
In analog transmission, the range of frequencies between two defined limits.

BASEBAND
In Packet Radio communications, the total frequency band occupied by the aggregate of all the data signals used to modulate a carrier. In LANs, a physical transmission path using direct digital signaling, usually at a rate stated in megabits per second.

BATTERY BACKUP
Usually associated with the internal TNC lithium cell used to maintain the information stored in the TNC's RAM. This battery backup holds the "user configuration" while the TNC is OFF. Other forms of battery backup is the power source that supplies power to a station or site when utility power is removed or fails. This power source is sometimes called "emergency or auxiliary power."

BAUD
A unit of signaling speed. The speed in Baud is the number of discrete conditions or signal elements per second. If each signal event represents only one bit condition, then Baud is the same as bits per second. Baud does NOT equal bits per second. Another method of expressing "baud" is; The unit of digital signal speed, equal to the number of events per second.

BAUDOT
A 5 bit code used in RTTY communications. Named after J. Baudot, an early French inventor of telegraphic instruments. Compare with: ASCII which is an 8 bit code capable of coding 256 characters instead of 32 for baudot.

BAYCOM
A simple modem and software package designed and supported by DL8MBT, DG3RBU and the Baycom group in Germany. Early versions were shareware. Recent versions are now marketed as a commercial product.

BBS
Bulletin Board System. This is a server which is accessed by packet stations to be a repository for messages and files. These messages and files can be accessed by a packet operator who connects to the BBS. BBS also have a capability called Forwarding which may be used to transfer files between
BBSs. (See autoforward)

BEAM
A directional antenna. Beams are usually made of aluminum and are constructed from a horizontal length of tubing having between 4 and 16 1/2 wave length aluminum elements. Beams for packet radio usually cost between $50 and $100. The key features of a beam are:
1. Directionality
2. Gain.
In this case gain means this is because less power and signal is wasted in the direction away from where the beam is pointed. The main lobe power is concentrated in the direction the beam is pointed.

BER
Bit Error Rate; The average number of errors that occur per fixed amount of data-bits sent. This number is usually stated as; error(s) per million bits.
Another way to express BER is the ratio between the number of bits transmitted and the number received in error on a transmission link. This is the process most often used as a measure of quality for data links.

BERT
Bit Error Rate Test/testing; The process of testing or proving the bit error rate(s). The device used to determine the BER is called a "BERT" meter and may be left in the digital stream without affecting the data being measured. The test method for digital links uses a psuedorandom repeating sequence of bits, comparing the received pattern with the known transmitted pattern for errors. Computing the gross errors over a fixed test interval. Error rate is stated in scientific notation as the number of errored bits per hundred thousand, million, ten million, or hundred million. Minimum acceptable error rate for voice channel data operations is one errored bit per 100,000 transmitted.

BETA TEST
Beta test is the pre-release testing of hardware or software with selected typical customers to find out if there are any bugs or problems before releasing it to the general public.

BID
Bulleting Identification; Usually applied to BBS bulletins that are forwarded across a Packet network. The purpose is to identify or track the bulletin (--e.g., source).

BINARY
A two state numbering system represented by the 0 (zero) and 1 (one). A binary digit is called a "bit". Digital data is represented by a one or zero bit when used in packet communications.

BINARY CODED DECIMAL (BCD)
A binary-coded notation in which each decimal digit of a number is expressed in binary form; Example: 23 decimal is 10111 in binary, and 0010 0011 in

BCD.
BINARY CODED DECIMAL INTERCHANGE CODE (BCDIC) 7-bit implementation of a code for synchronous data communications. In essence BCDIC has been replaced by EBCDIC at this point in time.

BIPOLAR
In communications, the predominant line signaling method used for baseband digital; zero and one values are represented by positive and negative voltages respectively, as in " polar " telegraph circuits. In high-speed integrated circuit electronics, a similar technique used for transmission within a CMOS chip is typified by the Bipolar CMOS .

BIT
Notation for a binary digit. The smallest unit of digital information. The bit can represent a choice of a one or zero (mark or space) in digital communications. A contraction of the words," binary digit."
BIT DURATION
The time taken for one bit to pass a point on a transmission link. Also called: bit length, bit time, bit interval, bit period, bit interval .

BIT ORIENTED
Descriptive of data communications protocols using a control byte rather than embedded control characters or control messages as well as having a high degree of transparency to codes used for messages. Typified by IBM's SDLC and the CCITT's HDLC of X.25 packet networks.

BITS PER SECOND (BPS, b/s)
Basic unit of measurement for raw transmission throughput on a link. Often stated in kilobits, megabits, or gigabits.

BIT-STUFFING
A technique used to prevent confusion between any 111111 bit pattern in the data and the flag character (01111110) used to delimit the start and end of each frame in the packet.

BLOCK
In Packet Radio communications, a string of data set into an "envelope" of synchronizing, addressing, control and error-checking characters transmitted as an entity. Equivalent to "frames" (MAXFRAME) in AX.25 Packet Radio systems.

BLOCK ERROR RATE (BLER)
The ratio of number of blocks transmitted to the number of blocks containing errors; a user-oriented measure of data transmission quality. Synonomous with "frame error rate" in digital communications line systems.

BLOCK LENGTH
Measure of the size of a transmission block in data communications; stated in characters, records, language words, computer words, characters; but rarely bits.

BOOT

Boot, reboot, and system boot, refer to a "cold start" of a computer or related devices.

BOOTSTRAP LOADER

In personal computers it is the sequence that searches predetermined disks for a Command Interpreter program, then a Configure System (CONFIG.SYS) or and AUTOEXEC.BAT file.

BPQ

A node or packet switch software written by John G8BPQ that creates a multiport node on an IBM PC or clone. Popular with BBS operators to provide multiconnected BBS services with several ports to both LAN and Backbone ports.

BPS

Bits per second. The rate at which binary data is transferred on a circuit. See also baud, data rate, transfer rate.

BREAK

In Packet and data transmission systems, a timed interruption of about 300 milliseconds, often intended to interrupt a distant transmitting station.

BREAKOUT NODE

This is a node that is capable of handling multiple links. In many cases packet nodes have been installed in places where several radios or backbone links are not allowed, such as on high mountains of great commercial value.

A breakout node holds no special purpose except it is a node that has proven to be expandable.

BRIDGE

In Packet networks, a set of nodes (2 or more) may be interfaced to form a bridge or gateway (node-stack) between frequencies or baud rates. In LANs, an electronic device providing a logical connection path between two LAN segments.

BROADCAST

In telecommunications, a transmission mode in which every message is transmitted to all stations. Similar to the broadcast that is used in conference or converse nodes.

BSQ

A digital/data communications protocol used to send binary files via packet radio.

BUFFER

A storage area or device (normally in RAM) where data overflow is contained until RAM or disk space can be made available for storage. The buffer is mainly used to hold data while it is being transferred from one computer to another.-e.g., A temporary storage medium to permit some difference in the capacity of two data devices to emit and accept data from each other.

BUG

Computer term for an error or mistake causing a processing delay or stoppage.

BULLETIN BOARD SYSTEM (BBS,

A communicating computer equipped so as to provide informational messages, file storage and transfer and a degree of message exchange to allow use by Packet Radio users. e.g MBL, FBB, AA4RE etc BBS programs.

BURST
In data communications, an event containing a number of elements, as in a burst of errors. In other communications, a term descriptive of the intermittent occurrence of errors.

BUS
A common physical conductor, to which several units of compatible type are connected in parallel, sharing use of the bus.

BUS INTERFACE UNIT (BIU)
IN LANs, the device furnishing direct connection of a DTE to the LAN bus.

BUSY HOURS
Prime time, that period of hours when connections are most in demand in a Packet Radio network.

BYPASS
The connection of two customer locations circumventing use of the Packet Switched Network, particularly locally.

BYTE
In computers, a very specifically-sized unit containing 8 bits for the computer to operate on. Sometimes called a "word" in computer systems.

C

C BAND

A portion of the electromagnetic spectrum used heavily microwave and satellite transmission. Frequencies in the region of 4 to 6 Gigahertz.

CALLBOOK SERVER

This is a network server whose function is to allow stations to access, in real time, Amateur radio callbook information. The servers are operated both stand-alone and as part of a BBS or DxCluster.

CARRIAGE RETURN

On a mechanical typewriter the motion of pressing or pushing the carriage return lever to the left until it stops, to allow a new line to be type on the paper supported by the carriage. On modern computer keyboards the carriage return key still exists and is either is labeled {Enter}, Return, or Carriage Return.The function of the carriage return key is to instruct the computer or remote device that the end of a typed line has been reached. On a terminal or computer emulating a terminal when the carriage return is pressed. In a computer, the binary number 00001101 is generated to cause a carriage return to be sent.

CARRIER

A signal of known characteristics that is modulated to carry information.

The receiver, knowing the expected characteristics of the carrier, can extract the information from it. However, noise or unintended changes to the carrier will, of course be also interpreted as part of the information.

CARRIER SENSE MULTIPLE ACCESS (CSMA)

A LAN access method in which stations listen to see if the transmission path is clear before starting to transmit. This is the method used in the AX.25 Terminal Node Controller (TNC).

CARRIER SENSE MULTIPLE ACCESS/COLLISION DETECTION (CSMA/CD)

A refinement of CSMA in which stations can identify not only an idle channel, but if a collision has just occurred, in which case they wait additional time to give the preceding stations access priority to clear their traffic.

CARRIER SYSTEM

A transmission system capable of providing multiple communications channels over a single physical path.

CATHODE RAY TUBE (CRT)

A common form of visual display for data terminals, similar to a television picture tube.

CCIR

Comite Consultatif Internationale des Radio, a major constituent of the International Telecommunications Union issuing both Radio Regulations and Recommendations for all uses of radio transmission.

CCITT

Committe Consultatif Internationale des Telephones et Telegraphes, or Consultative Committee of the International Telephone and Telegraph. An international counterpart to the Electronic Industries Association in Washington, D.C. EIA standard RS-232 and CCITT V.24 are similar. A major constituent of the International Telecommunications Union (ITU) that sets standards for the operation of telecommunications services across international boundaries. Some CCITT standards are adopted for use in the USA.

CELLULAR

Broken up into small areas, or cells(similar to the "honey-comb"). If a packet network is broken up into two kinds of links, user and backbone, only user links would be omni-directional. The coverage of a single user port might be thought of as a cell. The area covered by a cell would be best if there were a limited number of users in the cell. A suggested area of coverage is 50 total packet users or ten maximum on line at once. The cell size varies depending on what area the cell is in.

CHANNEL

A communications transmission path via any transmission medium - wire, radio, optical fiber etc.

CHANNELIZATION

Division of a larger capacity channel into a number of smaller channels for use by multiple functions.

CHARACTER

a unit of typographic information, usually variable as part of a language. Because data is handled and transferred as a series of characters,the term also can mean one bit pattern in a specific data code. Often referred to as a "word" in the computer programming sense. In their nature, these characters are 8-bit "words" conveying the instantaneous amplitude level of their transported signal.

CHARACTER ORIENTED

Descriptive of a Packet Radio communications protocol or transmission procedure that has control information transmitted in the form of special bytes called control characters

CHAT NODE

See conference node. See Convers node.

CHOKE/UNCHOKE

When a computer is unable to process data as fast as another computer is sending it the receiving computer may instruct the sending computer to stop sending the data. This condition sometimes occurs in a node network running theNET node code. An "Unchoke" packet is sent periodically to clear the nodes of a choke condition.

CIRCUIT

As applied to Packet Radio. A path including any needed supervisory and signaling or conditioning equipment for the transmission of digital signals. In a TheNET network a circuit is an assigned connection between two nodes.

Each of the two nodes has information to the effect that the circuit exists. The two nodes also have a routing table from which the first element on the path to the other node may be realized but the two nodes do not know all of the intervening nodes. The circuit exists until the destination user or server or the originating user or server disconnects, or until one of the two nodes decides that data cannot be sent any longer (due to L4 retry time-out or unchoke failure) or if no data is during the time set by the no activity time-out. In the recommended network the L4 retry time-out is 5 minutes times 2 retries and the no activity time-out is two hours.

CLOCKING

Repetitive, regularly timed signals used to control Packetized transmissions.

CMD:

An on screen prompt which is displayed by the TNC. This prompt informs the user that the TNC is in the "command" mode.

COAXIAL CABLE

A cable in which one conductor surrounds the other. The electromagnetic wave travels between the grounded outer shield and the central conductor. Coaxials can carry much wider bandwidth and higher frequencies than wire pairs. Where the maximum frequency capable on twisted pair wiring is about 10 megahertz and for short distances, coaxial cable readily carries several hundred megahertz for thousands feet.

COLLISION

Simultaneous transmissions on a Packet LAN that interferes with each other in a contention-based access scheme. Occurs when two or more terminal node controllers (TNC) attempt to transmit at nearly the same instant.

COMMON CONTROL SYSTEM

(A Packet node) An automatic switching system that makes use of common equipment to establish a connection. Once connection is made, the common control equipment is available to establish another connection.

COMPATIBILITY

A property in data processing and telecommunications systems permitting exchange of information directly and in usable form. IBM compatible implies identical or interchangeable signals and methodologies on a non-IBM PC as that of a "true-blue" IBM PC.

COMPRESSION

In data communications, compacting the number of bits used to represent the information, losing the character structure while reducing the circuit time or capacity needed to transfer the data. Decompression is then needed at the receiving end to again render the data useful. Example; ZIPPED files.

CONFERENCE NODE

A node which has a similar feature to theNET X-1J+ TALK mode whereby a number of users may connect and enter into a "round-table" discussion. This mode is sometimes referred to as a "CONVERS NODE."

CONNECTED

The condition that occurs when two Packet stations are described as being "connected". The state in which the two station read only those Packets from each other when MCON is OFF.

CONTROL CHARACTER

A character inserted into a data stream to notify the receiver of a special function to perform or to identify the purpose of the data or message associated with it. An example of a control character is the Control G. A control "G" will ring the bell of the connected or target station.

CONTROL MODE

The state a TNC must be in to permit command or control actions to occur.

CONTROL SIGNALS

Signals passed between parts of a communications system to oversee operation and configuration of the system.

CONTROL C or Ctrl C

This is used to bring a TNC to the "command" (cmd:) mode from the "converse" or "transparent" mode. It is executed by holding the "control" key down and pressing the "C" key. In most TNC's it is not necessary to press after executing a Ctrl C.

CONVERSATIONAL MODE (CHAT MODE)

Interactive data communications carried on between Packet stations, as in data or keyboard conversation.

COSI

Connection-oriented Open Systems Interconnect. A project of W2VY and N2DSY to implement for amateur packet radio use the connection-oriented protocols published by the International Standards Organization (ISO) and the International Consultative Committee for Telephony and Telegraphy (CCITT). (OSI protocols include both connection-oriented and connectionless flavors, hence the inclusion of the qualifier "connection-oriented" in the name).

CPU

The Central Processing Unit that controls data flow and "thinking" function within a computer. When supported by a "MATH Copressor", it can perform computations at greater speeds.

CR (CARRIAGE RETURN or [Enter])

A control character causing the print or display position to move to the first position on the line, drawn from the typewriter and teleprinter function with similar action.

CROSS CONNECTION (X-CONNECT)

In Packet Radio communications systems, a bit stream addressed between two ports of a node or routing unit. See also "digital cross-connect as in theNET X-1J4."

CROSS TALK

Unwanted energy (speech, tone or digital pulses) transferred from one transmission path to another. Comprises part of the "noise" observed on analog communications circuits.

CYCLIC REDUNDANCY CHECK (CRC)

A powerful error checking method for data and digital communications. The transmitting terminal computes a numeric value representative of the number of marking bits in the associated block of data and sends that value to the receiver, where the number is recomputed to compare against the block as received. Values of CRC-8 and CRC-16 are adequate for most AX.25 messages, while CRC-32 is needed mainly for very long blocks of tens of thousands of characters as noted in Internet type environments.

D

DATA

Multiple units of information. Singular is " datum ".

DATA CIRCUIT

Packet Radio Communications channels provided specifically for the exchange of data as compared to voice or other information forms.

DATA COMMUNICATIONS EQUIPMENT (DCE)

The device or TNC which provides signal conversion so that data communications can be established, maintained, and discontinued. Some DCE are controlled through local or remote software commands Standards body term for devices that perform signal conversion at the extremities of a data circuit. A data set (modem) or a CSU are common examples of a DCE. Contrast to DTE.

DATA ENCRYPTION STANDARD (DES)

A cryptographic standard defined by the National Institute of Science and Technology (NIST) for the general public to encrypt and decrypt digital and data transmissions.

DataEngine

A TNC manufactured and marketed by Kantronics. The DataEngine has two HDLC radio ports and one serial port. The modem are plugged in and provide a usuable on-air data-rate from 300 to 19,2 Kbps.

DATA RATE

The basic rate at which data is transferred on a circuit. Often referred to as "baud rate." A more correct statement is; bits per second or bps. (See baud, bps)

DATA SET

A telephone industry name for a modem.

DATA LINK

A serial data communications pathway, generally between two adjacent nodes without an intervening node.

DATA LINK CONTROL

Synonomous with link layer data protocols related to AX.25 Packet Radio. The second layer of the ISO Reference Model for Open Systems Interconnection (OSI).

DATA TERMINAL

A station in a system capable of sending and/or receiving data signals.

DATA TERMINAL EQUIPMENT (DTE)

The standards-body term for a computer, user terminal, workstation or personal computer used for data communications. Data Terminal Equipment is another name for the computer used to send and receive data in digital form at its comport (I/O) port to and from a terminal node controller (TNC).

DB-9P and DB-9S

Electronics Industries Association's recommended connector for use with RS-422A standard.

DB25P and DB25S

The connectors which will support all 25 of the RS-232 signals. Recommended by the EIA.

DECIBEL (DB)

The logarithmic unit or measure of a ratio between two powers, P1 and P2.The equation is: db = 10 log10 P2/P1

BELOW ARE SOME OF THE MNEMONICS ASSOCIATED WITH "DECIBEL:"

DECIBEL (dB)

A unit of measurement representing the logarithmic ratio of two voltagcurrents or power levels; used in telecommunications to express transmission loss or gain; defined as one-tenth of a Bel, hence the appropriate notation is dB, shown here.dBm Identifier meaning "decibels referred to one milliwatt," the common reference point for power levels in telecommunications circuits. dBm0 Identifier meaning "decibels referenced to one milliwatt and corrected to a Zero dBm effective power level; "used to state the relation of a signal level on a transmission line at other than a one-milliwatt point. Example: Throughout an analog system, a data set signal is to be kept 13 dB

below that for a single test tone, stated as "minus 13 dBm0

At a carrier modulator input where test tone level is -16 dBm A data signal should then be 13 dB lower, or -19 dBm.

dBmp

Identifier meaning "decibels below reference tone using psophometric (filter) weighting," the CCITT method for noise measurements; has about 2 dB variance from Bell methods.

dBm0p

Identifier for CCITT psophometric-weighted noise measurements adjusted to a relative 0 dBm transmission level point.

Example: An absolute measurement of minus 40 dBmp noise at a carrier channel output point would mean a signal-to-noise ratio of about 47 dBm0p exists at that point on the circuit.

dBrn

Identifier meaning "decibels above reference noise," the reference commonly used being 90 decibels below one milliwatt.

dBrnC

Identifier meaning "decibels above reference noise measured through a (filter) weighting network approximating a " type C voice message channel;" the common North American nomenclature for a DDD trunk channel; having a reference of 90 decibels below one milliwatt of power.

dBrnC0

Commonly pronounced "de-brink-o," identifier meaning "decibels above reference noise with C message weighting adjusted for equivalence to a 0 dBm (one milliwatt) equivalent circuit point."

Example: A direct measurement of 49 dBrnC0 at the nominal +7 dBm output of a carrier demodulator would mean the noise had been offset by 7 dB; thus the reading in DBrnC0 would be 42.

DEDICATED LINK

A point-to-point link between two dedicated ports for the exclusive use of those ports or nodes or for the use of stations passing through the network, using those two nodes.

DEDICATED PORT

This is a port designated for a specific purpose, usually a link to another network or application hardware. Other stations who would connect through the network might pass across the link that uses the dedicated port. No user station would access the dedicated port on the dedicated port's frequency.

DCE - DTE

interfaces, most typically RS-232 type.

DESTINATION FIELD

Location in a message header that contains the address of the station for which the message is destined.

DEVIATION

The deviation of an FM radio is the maximum change or shift in the carrier

frequency during modulation. It is usually expressed as peak deviation in kilohertz.

DIDDLE

A term used to describe the AFSK tone shifting in some nodes and TNC.

DIGICOM 64

A software and modem package designed to emulate a TNC on a Commodore 64 computer.

DIGIPEATER

A store and forward "digital repeater" which will receive and transmit a data packet on the same frequency. All amateur packet station are capable of digital repeating in a simplex environment.

DIGITAL SIGNAL

An electrical signal that changes in discrete steps each representing a numerical data value, or logic state.

DIGITAL SIGNALING

Using techniques that transmit information as a series of discontinuous pulsed signals in a pattern representative of the inputted signals; requiring reconstitution at the receiver; capable of being regenerated to minimize noise contribution in transmission. Contrast to Analog.

DIGITAL SWITCHING

Establishing and maintaining a connection under stored program control, when information passed through the switching matrix is in the form of binary encoded information.

DIODE MATRIX

The device used to interface several TheNET nodes to enable communications over their RS-232 ports. When more than two TNCs are used at a node site the diode matrix is required for cross-connection and internode linking.

DIP

Dual In-line Package, as applied to sub-miniature switches and monolithic

integrated circuits.

DISCRIMINATOR

In an FM radio the discriminator is the circuit that derives audio from the IF signal. After the discriminator the FM receiver will change the audio to remove white noise.

DISK DRIVE

A disk drive is a computer accessory that stores data in the form of magnetic impulses on a flat media that is much like an extremely high quality magnetic recording tape. The media is on a spinning platter, like a phonograph. The media is of two basic qualities and is called floppy or hard disks. Floppy media is low tolerance, meaning that if the media is dented or dirty it should still work. Floppy media can store about 200,000 characters of data per square inch. Most floppies store less. The rate at which data can be read or written to a floppy drive usually less than 30,000 characters of data per second.

DOVE

An OSCAR satellite (OSCAR 17) whose full name Is Digital Orbiting Voice Encoder.

DOWNLINK

A circuit from a node to a user, initiated by the node on command from a distant user.

DSP

Digital Signal Processing. A modern technique of analyzing analog signals by

converting the analog signal to a digital form and processing it with a specialized computer circuit.

DTE

Data Terminal Equipment. Usually refers to a terminal or computer or any equipment that generates data.

DTR

Data Terminal Ready. One of the RS-232 signals (pin 20 on DB-25) that indicates to the computer or terminal of the ready-state to send data. It is associated with the RTS (ready To Send) signal and is often used in conjunction with this signal to enable one form of "hardware" handshaking.

DUAL TONE MULTI-FREQUENCY (DTMF)

Also known as Touch-Tone. A type of signaling which emits two distinct frequencies for each indicated digit.

DUMB TERMINAL

A data communications euphemism indicating a DTE with no processing capability. The data equivalent of a KSR teleprinter.

DUPLEX

Two-way transmission. Duplex means two channel. A full duplex signal consists of two separate channels. Both ends of the radio circuit need to have a separate receiver and transmitter such that the receiver on each end can hear the other station's transmitter regardless of the state of the local transmitter.

DUPLEX DIGIPEATER

Similar to a simplex digipeater, except that different receive and transmit frequencies are used. Compare to: Full duplex real-time repeater which repeats received data at exactly the same time.

DWAIT

Digipeat WAIT. A delay in sending a packet automatically inserted by a TNC when originating a packet. The delay starts when a packet is ready to be sent, after the channel becomes clear. A digipeated packet is sent without waiting this delay. Used as a collision avoidance system when digipeaters are in use.

DxCluster

A server used by HF operators to pass information about contacts. This software, originally written by AK1A, also operates as a database of HF related information. A key feature of the DxCluster software is that DxClusters may share contact information in realtime.

DYNAMIC REROUTING

In a network where redundancy exists in the backbone from one city to another some types of network software allow for the network to recover automatically from backbone hardware failure by rerouting traffic through the redundant link. This is called "dynamic rerouting" as it can adjust dynamically to a changing network.

E

EOC

Emergency Operations Center. This is a term used by state governments for a state or county government owned facility where emergency services and radio equipment is co-located. The EOC provides for rapid deployment and coordination related to emergency communications and associated drills.

EARTH STATION (GROUND STATION)

A microwave radio transmitting and receiving station working with communications satellites.

ECHO

A signal that has been reflected or otherwise returned with sufficient magnitude and delay to be perceived at the far end of the circuit.

ECHO CANCELER

A echo removal device that operates by generating an exact opposite of any echo signal and injecting it into the transmission path to cancel echoes. Used in both speech telephony and in some higher-speed data modems, notably those compliant with CCITT V.32.

ECHO CHECK

One method of verifying accuracy of Packet transmissions; Sometimes called "pinging" by returning received data back to the sender as verification and to determine path throughput level.

EDIT

Preparation of data for a later operation; may include rearrangement or addition of data, deletion of unwanted data, format changes, code conversion, or data compression.

EIA RS-232

The most common DTE serial interface by far, in use for almost 30 years, with several revisions and additions; international equivalent: The suite of CCITT V.24 and V.28 combined with ISO 2110.

ELECTROMAGNETIC SPECTRUM

The entire range of wavelengths (the inverse of frequency) of electromagnetic waves extending from cosmic and Gamma rays down through visible light and heat to every form of radio communications signal.

ELECTRONIC MAIL

A feature of LANs for transmission of computer-generated messages within a closed community of users on the LAN.

EMULATE/EMULATION

Imitating a system or device such that a connected device accepts the same information, executes the same computer programs and achieves the same results as if the emulator were one of its own kind. Most often, emulation is a downward step in capability of the device being used, as when a personal computer is used to emulate a mechanical teleprinter or a "dumb" terminal on a computer network. While some degree of upward emulation is possible, it is less prevalent in the broad view of computer communications.

ENCRYPTION

The systematic encoding of a message or bit stream before transmission to prevent unauthorized recipients from understanding it. The process of again rendering the information readable is DECRYPTION.

EPROM

Erasable Programmable Read Only Memory. This is an integrated circuit (IC) which is used in computers, including TNCs, to permanently hold a computer program. In TNCs all of the program is located in one EPROM. EPROMs are erasable using ultraviolet light for between 2 and 40 minutes. EPROMs have a small lens in their top which exposes the internal electronics. The EPROM used for The X-1J4 is usually a 27C512.

EQUALIZATION

The procedure of compensating for fluctuation in circuit amplitude, or envelope delay distortion.

ERLANG

A widely-used unit of telecommunications traffic intensity, named after work of the Danish statistician, D. K. Erlang. One Erlang is the intensity at which one traffic path would be continuously occupied.

ERROR

In Packet Radio communications, any unwanted change in the contents of a transmission.

ERROR CONTROL

In Packet Radio communications, methods used to detect and correct transmission channel errors.

ERROR RATE

In Packet Radio communications, the ratio of bits, characters, elements,blocks, messages or files incorrectly received to the total number transmitted during a specified time interval.

ETHERNET

Originally the trade name for a LAN developed by Xerox Corporation; later supported by Digital Equipment Corporation, Intel Corporation and Hewlett-Packard; now standardized as IEEE specification 802.3.

EXTENDED BINARY CODED DECIMAL INTERCHANGE CODE (EBCDIC)

IBM's proprietary 8-bit code for synchronous data communications. Has numerous variations of control character meanings.

F

FACSIMILE (FAX)

Graphic transmission of pictures, maps or documents via communications circuits using terminal devices that scan documents, transforming scanned images into coded data-like signals and reproduce likenesses of original documents at a distant point.

FALSE ROUTE

In a network using TheNET software the node routing is generated automatically by the nodes themselves. If improperly managed it is quite possible for routing to be discovered and used by the nodes such that DX propagation paths are treated as real paths. In this case a route may be created in the routing table that depends on "'Lift" or enhanced propagation conditions.

When the lift, dissappears (mostly during daylight hours) the nodes will be helplessly trying the "false route." This condition is preventable in a TheNET system by manually controlling the route tables to specify valid routes to neighbor nodes.

FBBS also FBB BBS

An increasingly popular amateur BBS software written by by Jean-Paul F6FBB and others.

FCC (FEDERAL COMMUNICATIONS COMMISSION)

A board of Presidentially-appointed commissioners empowered to regulate interstate and international communications and all uses of radio in the United States. Operates under the Communications Act of 1934 and several more recent laws. Disseminates its own regulations interpreting those laws, as Title 47 of the Code of Federal Regulations (CFR 47, 47CFR).

FCS

Frame Check Sequence. A 16 bit (2 byte) number included with each frame in the packet used for error checking.

FEC

Forward Error Correction. A technique of error correction in which packets or AMTOR groups combine the data from two or more transmissions to yield less errors. AMTOR FEC mode, the data is sent twice and the receiving station(s) record all known characters without resorting to an ARQ ACK/NAK transmission.

F.E.M.A.

Federal Emergency Management Agency.

FIRMWARE

Software stored permanently in a integrated circuit (IC) called a ROM or an EPROM.

FIBER OPTICS (FO) "Light-Pipe" a technology using light as a digital information bearer. Fiber optic cables (light pipes) are a direct replacement for conventional wire, coaxial cable and many forms of radio, including microwave. The shortcoming of fiber optics is when a fade occurs in it, it is of long duration and may have been caused by a "back-hoe." Thus the term "Back-hoe fade."

FILE SERVER (SERVER)

In LANs, a station, often microcomputer-based, that provides the mass storage and file access to users on the LAN. Server capabilities vary widely; some even include ability to " gateway " to other communications means or " bridge " to a similar nearby LAN, or even determine for users if those functions are needed and decide the route to the user's destination, in which case they are called " routers ".

FIRMWARE

Permanent or semipermanent control coding built into a software-operated computer device that operates an application program, instruction set, operating routine or other user-oriented instructions to a computer; often resident in a ROM (Read Only Memory) chip to simplify installation. FLAG - In data transmission, an indicator of an expected event like the beginning or end of a block of data. In CCITT standards for X.25 networks, the 8-bit character 01111110 has been uniquely established with the name "Flag" to be used at the beginning and end of a block.

FLOW CONTROL

The process that starts and stops terminal output to prevent loss of characters or data by the receiving device. In Packet and data communications, the use of buffering and other mechanisms that operate to avoid data loss in case the receiver cannot keep up with the transmitter.

The ASCII control characters X-ON and X-OFF (Ctrl-Q & Ctrl-S) are frequently-used examples. They are sent in reverse direction as an instruction for the sender to hold or continue (software handshaking).

FLAG

A data character (01111110) used to delimit packet (beginning and end) and to separate multiple frames in one packet transmission. The same character is often used during the TxDELAY to help synchronize the TNC receiver circuits at the beginning of packets.

FM - Frequency Modulation.

This is a method of transferring data or voice information over a carrier signal. FM is achieved by changing the frequency of the carrier in proportion to the wave form of the superimposed audio signal be it voice or data. In most FM voice applications, the FM deviation is set to 5 kHz or less. In Packet or digital FM communications the deviation is set between 3 and 3.5 kHz. Never set Packet Radio deviation to more than 3.5 KHz.

FORWARDING

The transfer of files between BBSs. (See autoforward)

FORWARD FILE

This is the disk file on a packet bulletin board system (PBBS) that is responsible for directing the autoforward operation. By making entries in this file the PBBS system may select what packet paths are used to each PBBS that is forwarded to, when each operation is per formed and what traffic is sent during each piece of the forwarding operation. FOOTPRINT - In satellite communications, the area on the surface of the earth that a given satellite covers; this technology has reached a high state of development, withsatellite coverages capable of being quite shaped and tailored to the purpose of the satellite.

FORWARD ERROR CORRECTION (FEC)

An error-correcting technique that avoids the need for any reverse channel by enabling self-correction of errors at the receiver. FEC operates by adding information that enables the receiver to determine what the error was and to substitute information that corrects the error.

FRACK

FRame ACKnowledge delay: This is the time after a packet is transmitted by a TNC before the TNC decides that a frame acknowledge is not going to occur. At that point the TNC performs backoff (some TNCs + TCP/IP) and a retry. FRACK is calculated based on the number of digipeaters that you specify in your connect command. fr~ame

FRAME

In AX.25 Packet Radio communications, a group of bits or characters sent serially employing a logical unit of information between data link layer entities that contains its own control information for addressing and error checking. Example; see MAXFrame

FREQUENCY

The number of complete cycles of an event (in communications typically an alternating current signal) per unit of time; usually expressed by means of the unit ' Hertz," named after Heinrich Hertz an early German investigator of the properties of high-frequency alternating current waves.

FREQUENCY DIVISION MULTIPLEXING (FDM)

The analog method of deriving multiple transmission channels from a single physical facility; divides of an available frequency range (bandwidth) into various subchannels. Widely used in many formats by virtually every kind of telecommunications technology; the " carrier systems " of telephony. Also called Frequency Division Multiplex ; Frequency Division Mux .

FREQUENCY RESPONSE

The measurement of how well a transmission channel or device transports all the frequencies sent into it; a measure of how faithfully signals are transported or reproduced. In Bell terms, the arithmetic is reversed and the name " amplitude response " or " amplitude variation " is used for the same expression.

FREQUENCY SHIFT KEYING (FSK)

When associated with HF (300 baud) Packet, the shift is 200 Hz. One of the more basic and durable forms of transmitting binary information; in FSK, one of the binary states is represented by one known frequency and the other by another known frequency. The receiver produces outputs only when one of the two known frequencies is received in the absence of the other. Applications of FSK abound in every form of telecommunications.

FRESNEL ZONE

The area in open space that must be practically free of obstructions for a microwave radio path to function properly; some degree of Fresnel consideration is required in the immediate vicinity of the form of microwave radio used on satellite links.

FTP - File Transport Protocol.

This is a part of TCP/IP which allows a user of a TCP/IP host to request or send files from another TCP/IP station.

FSK - Frequency Shift Keying.

A method of digital modulation where the carrier is switched between two distinct frequencies. This is the technique used on HF packet.

FULL DUPLEX (FDX)

A circuit which allows independent transmission information in both directions simultaneously. - Synonym: In wire telephony, 4 wire circuit.

G

G3RUH MODEM

A 9600 bps plug-in modem for TNC-2s and other amateur TNCs. Circuitry contains adaptable filters to adjust for bandwidth limitations in commercial radios and a "randomizer" circuit to prevent DC offsets on modulated data. Similar to but may not be totally compatible with K9NG modem. Believed to be compatible with the most recent TAPR 9600 bps modem.

G8BPQ CODE

John Wiseman, G8BPQ, developed a Terminate-Stay-Resident program for the IBM PC and compatibles that would imitate TheNET and allow node access for a program that runs on the PC.

G8KBB X1J CODE

Dave Roberts developer of the most popular Packet Radio Networking node code in use today. This program is a derivitive of the Nord)(Link TheNET node code but has many enhacanced features added plus the functionality to enable allows routing from a TheNET system directly to the Personal mailbox, Personal BBS, BBS, DXCluster or other Packet programs running on the PC.

GAIN

Denotes an increase in signal power in transmission from one point to another; usually expressed in decibels. Antonym: " Loss ," a reduction in signal power.

GATEWAY

With Packet radio, a gateway is a "bridge" that provides a means to communicate digitally from one frequency into another or from one baud ratto another. (see also "BRIDGE") A node-stack connection between two different Packet networks, frequencies, baudrates or LAN. A configuration of nodes where connectivity is available by deliberate manipulation but where automatic end-to-end routing is not possible. This is useful for connecting two networks together such that users and servers on one network can access users and servers on the other network without compromising networking practices on either.

GEOSYNCHRONOUS ORBIT

a position at an approximate altitude of 23,000 miles above the Equator, where a velocity of about 1,000 miles per hour in the same direction as Earth's rotation makes a satellite appear stationary over the Earth's surface. At such a point, ground-based microwave antennae can remain fixed and achieve linkage with transponders on board the satellite to produce a microwave relay between points as much as one-third of the way around the globe, or about 8,000 miles.

GROUP DELAY DISTORTION

Also called envelope delay distortion. A distortion of the data signal produced when the different frequency spectral components of the digital signal are phase shifted by different amounts resulting in a distorted pulse shape. For best results, it is important that radio filters, amplifiers and other components in the communication system have a constant phase shift across their bandwidth. This is called "flat group delay" characteristic.

H

HALF DUPLEX

A circuit capable of transmitting or receiving information in two directions, but only one direction at a time; a function of both computer protocols and transmission channels. Many computers operate only half duplex on transmission channels capable of full duplex operation.

HAMMING CODE

In data transmission, a code with added redundant bits for error detection purposes.

HANDSHAKE

The exchange of control sequences between two locations to set up needed conditions for communications. In the strictest sense, even the steps of dialing a telephone call can be thought of as a "handshake sequence." On RS-232 linked devices, the RTS (or DTR) and CTS lines are used for hardware hand-shaking or Control-S/Control-Q characters for software handshaking. On packet radio circuits, supervisory bytes in the packet and ACK and other control frames are used for handshaking.

HAPN

Hamilton Area Packet Network. An active amateur packet group in Hamilton, ON best known for the development and marketing of a 4800 bps modem (for installation in TNC-2 or clones) and plug-in TNC cards for PCs

HARDWIRE

Using physical wire or cable directly between units of hardware equipment.

HARMONIC

An exact multiple of a "fundamental" frequency. Examples: Second harmonic = double the fundamental frequency; third harmonic = three times, and 12th harmonic = one dozen times and so on. Sometimes an expression of the required bandwidth for transmission, as in the case of binary transmission where it is well established that a bandwidth equal to the tenth odd harmonic is needed for accurate reception of the pulses; this means the fundamental, third, fifth, seventh, ninth, eleventh, thirteenth, fifteenth, seventeenth, nineteenth and twenty-first harmonics must be passed; thus a 50 bps binary pulse requires a bandwidth of 50 x 21 or 1050 Hertz for accurate capture of the pulses ... unless it is somehow encoded for transmission.

HARMONIC DISTORTION

The ratio, expressed in decibels, of the power at the fundamental frequency, to the power of a harmonic of that fundamental. Odd harmonics, particularly third harmonics, are especially harmful to many forms of telecommunications by both wire and radio; as well, they are annoyingly difficult to design out of electronic circuitry.

HBAUD

Data speed between the TNC and the transceiver. Sometimes referred to as the "station to station" baud rate.

HDLC (HIGH LEVEL DATA LINK CONTROL)

A bit-oriented international standard data link protocol used in CCITT X.25 packet network links and influencing many others. An example is the process employed in X.25, and AX.25 to format data into Packets. These packets of data have the destination address, checksum count, and other necessary components added through HDLC to help make it an error-free mode. The ISO level 2 link level

HEADER

That portion of a message containing information for routing, handling and delivering a message, such as address, size, priority, intermediate routing and synchronization signals.

HEARD OR MHEARD LIST

Monitored & Heard; On several different packet devices, including user TNC BBSs, nodes etc.. there exists a feature whereby a list of stations heard are recorded. This list is called a heard list. Access to the list is different depending on the application. Typing an M to a TheNET X-1J4 node will recover a list of recent stations "heard" by the node.

HEXADECIMAL

A number system based on 16, providing convenient notation of the 16 possible combinations of half an 8-bit data processing byte; uses digits 0 through 9 followed by letters A through F to count to 16, thus two " hex " digits can describe one byte in software. Example: ASCII letter capital "A" has the decimal value 65 but is written as 41 in hex software code, while small "z" has the decimal value 122 but is noted as 7A in hex, still requiring only two digits instead of three. Hexadecimal. Numbers to the base 16 (0-9, A-F).Using only two hex digits from 00 to FF, a code of 256 different characters can be described as is done with the adaptation of ASCII used by personal computers; the added characters beyond 128 are often called "Extended ASCII," or "IBM graphics characters."

HOST

The computer or massive memory storage facility where accessible data-bases are held. These data-base are accessed by computers or terminals which are allowed access via pre-assigned passwords or call signs. The host mode as related to Packet is a computer or terminal attached to a TheNET node when operating in host mode for sysop entry to the serial port. Host is also the name given the computer that controls a TCP/IP or Internet node. (See host mode)

HOST MODE

WB8DED created a software package for the TAPR TNC 1 that was called Host Mode. This package was later created for TNC 2. Some BBS programs took advantage of the command language in Host Mode to control the TNC and to allow multiple users to connect to the BBS at the same time. AA4RE BBS may have been the first software to use this feature. TheNET incorporates a very small subset of the Host Mode command set. Host Mode is used to refer to the condition where a node has a CRT tenninal or computer plugged into it that will be used in ASCII mode (not using networking protocol).

HOT STANDBY/HOT SPARE

Alternate equipment ready for immediate use if the normal equipment fails.

HTS

Hidden Transmitter Syndrome: This describes a condition where throughput is drastically reduced to well below the specified baud rate because a single station is able to hear two or more stations that can't hear each other.

I F - Intermediate Frequency.

The function of a radio receiver is to convert a radio wave, which has audio on it, to audio information to be played into a speaker or into a packet modem. The process is often done in two steps. First the radio signal (RF or radio frequency) is converted from the tuned frequency to a known constant frequency. This is done by mixing the incoming signal with the VFO or synthesizer. This known constant frequency is the I F. Next the IF is converted into audio via a discriminator (in the case of FM). I F Bandwidth; Intermediate Frequency bandwidth. The width of the band of signals that can pass easily through the intermediate frequency stage of a superheterodyne receiver.

INFRARED

That portion of the electromagnetic spectrum located at frequencies just below visible light; in fact, the lasers used for so-called " long-wavelength " fiber optics communications at 1300 nanometers are really in the " near-infrared " region, producing an extremely deep ruby red color of such purity and strength as to damage human eye retina.

INITIALIZE

Setting all counters, switches, addresses or pointer registers to zero or the beginning of, or at prescribed points in the operation of a computer routine. As related to the "reset" of a Packet node or "rebooting" a computer.

INPUT/OUTPUT (I/O) CHANNEL/PORT

In computers, the hardware function, usually a bus of parallel wires, hence "channel," that transports data in parallel form between the CPU and peripherals like storage, printers or communications.

INTELLIGENT TERMINAL

A terminal containing a programmable processor capable of some degree of local processing; the range of functions and degree of capability is not standardized and subject to wide discussion of what constitutes "intelligence."

INTERACTIVE

Involving a duplex, "conversational" exchange between a user and a computer.

INTERFACE

The junction or point of interconnection between two systems or equipment having different characteristics; has both hardware and software implications. Most interface references related to Packet Radio refer to the cabling between the TNC and transceiver, or between the computer and the TNC.

INTERFERENCE

Any unwanted noise, crosstalk or spurious signals on a communications circuit that acts to reduce the intelligibility of the desired information signal or speech. INTERLEAVING **(INTERLEAVE)**

In Packet or data communications, interleaving may be a character or bit interleaved, with optimum applications for each. A technique to minimize effects of error bursts on message throughput by interleaving groups of characters or blocks that approximate the burst length.

INTERNATIONAL STANDARDS ORGANIZATION (ISO)

A world standards body that generally sets standards for any product fabricated or manufactured. ISO is resident in Geneva, Switzerland.

INTERNET

The Internet is a public system of computers which communicate over commercial lines (usually telephone or fiber optic leased telephone lines) using TCP/IP. Usage of the Internet network is free. Usage of the computers that are connected through other services to the Internet are not free. Most people who have access to the Internet either pay a fee or having a connection to the network from work or school.

IP - Internet Protocol.

The core protocol of the ARPA suite IP is a simple protocol that handles addressing, fragmentation and type-of-service routing in the heterogeneous internet environmentIS - Intermediate System. ISO's term for a packet switch.ISO standards apply to physical aspects of the "25-pin connector" of CCITT V.24/28 data interfaces (RS-232), definitions of several layers of data networks for which different hardware units may be required, and such diverse things as the exposure speeds of photographic film and definitions of units of measurement.

INTERRUPT

Data processing term for a processing stoppage made in such a way as to be resumable. Compare to a " halt ," typically meaning a stoppage that requires initializing the machine to restart processing.

ISDN (INTEGRATED SERVICES DIGITAL NETWORK)

A global plan under auspices of the CCITT to provide any information service users may desire on a single worldwide public switched network. The ultimateISDN has as its goal the elimination of need for discrete telephone, telegraph, data, packet and other networks as well as physically dedicated "special services " circuits as now required to provide broadcast, video, high-speed data and numerous functions users want

J

JHEARD

A command associated with the PBBS and mailbox features of many popular TNCs. When the Jheard command is invoked, a list of the most recent or "just heard" stations will be displayed. If the Jheard command is executed with a "JL", the paths indicating the stations callsign, origin, and digipeaters will be displayed.

JITTER

Short term instability of the amplitude and/or phase of a signal. The latter condition is commonly called PHASE JITTER. Variations in the phase or amplitude of a data modulated signal having no relationship to the data. In amateur packet signals, phase jitter may cause error in decoding the data.

JNOS

A version of KA9Q NOS written by WG7J that combine a BBS, node, and conference server.

JUMP SCROLLING

Characteristic of a terminal with vertical motions of a whole line of characters at a time in discrete steps of one line, much as a teleprinter terminal might do. Contrast with " smooth scrolling " as done by graphics terminals.

K

KANTRONICS

Kantronics designs, manufactures and markets a range of amateur packet products including the popular KPC TNCs and KAM multimode controller.Ka BAND Microwave radio frequencies in the region of 20 to 30 gigahertz, portions of which are used for local microwave " bypass ," notably the region near 23 gigahertz , while future satellite applications have allocations reserved as well.

Ku BAND

Microwave radio frequencies in the region of 10 to 20 gigahertz, portions of which are used for satellite (notably VSAT) operations at 12 to 14 gigahertz and local terrestrial " bypass " at 10 and 18 gigahertz.

KEYBOARD-TO-KEYBOARD

Communications between two packet user stations in real time. A fun part of Packet radio that is again being experienced by many Packet users. Emergency digital communications are but a few ways that keyboard-to-keyboard is useful.

KISS

Keep It Simple & Short. The TNC operating mode where the TNC merely translates packets between half duplex, synchronous HDLC on the radio port and full duplex asynchronous SLIP framing on the host port; the host computer must implement all higher level protocols, including AX25 if it is used. . The KISS TNC is only responsible for TX delay and DCD hold-off. Kiss is used with TCP/IP hosts and also often used with BPQ and other such Pbased packet switches.

L

LAN - Local Area Network:

A LAN is the user access point, be it node, gateway or cluster. LAN users which are home stations running minimum antenna and power configurations to access the node may access multiple servers through the network via the local access node

LASER

Acronym for: Light Amplification by Stimulated Emission of Radiation; converters of electrical energy into light of great purity and thus controllability adequate for telecommunications by guiding the energy along glass waveguides; used more commonly for high-capacity, long-haul fiberoptic links of common carriers; the fiber links of end users most commonly employ less expensive Light Emitting Diodes (LED) for shorter distances and lower capacities.

LATENCY

Used by some to describe the time delay from the point when a Packet network station seeks access to a channel and the time access is granted by the network; an evolving term unique to certain LANs.

LAYER; LAYERING; LAYERED ARCHITECTURE

Nomenclature of the OSI Reference Model for data transport that defines the functions in each step of a hierarchy of operations that must occur in order to transfer information between points.

LED (LIGHT EMITTING DIODE)

A semiconductor device that emits light under proper electrical conditions. Used both for simple indicators on electronic equipment and (with proper selection and use)as the source of signals for short-range (multimode) fiber optic transmission systems.

LEVEL

An expression of the relative signal strength at a point in a communications circuit compared to a standard; the standard is most often 1 milliwatt of power at a frequency of 1000 Hertz in a 600 Ohm load. The output impedance of most terminal node controllers is 600 ohms.

LINE PRINTER

Descriptive of computer printers that set and print an entire line of data

at a time. --e.g., Line-printer or LPT1; Often indicative of a high-speed, high volume printer. LINE SIDE - Descriptive of observing from or sending into the transmission path.LINK LAYER The logical second layer of the OSI Reference Model for Open Systems Interconnection, located between the Physical and Network layers. Level 2 in the 7 layer OSI computer communications protocol set. AX.25 is the amateur packet level 2 protocol.

LOCAL AREA NETWORK (LAN)

When associated with amateur radio Packet, the term defines an area or locale where a group of Packeteers use the same frequency to converse, or receive messages into their personal Packet mailbox (SEE ALSO "LAN").

LOOPBACK

A test in which the output of a modem modulator or other full-duplex digital device is looped back to the input of the demodulator or device. The looped back signal may be either analog or digital. LOOP BACK (pinging) - A transmission testing method of simply having the distant node (end) on a network send back the signals it receives for evaluation at the transmitting end.

LOCKED NODE

TheNET nodes have the capacity to generate routing lists automatically based on parameters set in the node's RAM. The parameters specify default quality values to be assigned to routes to each neighbor, separately defined for radio port neighbors and RS-232 port neighbors.

LOCKED ROUTE

TheNET nodes have the capacity to generate routing lists automatically based on parameters set in the node's RAM. The parameters specify default quality values to be assigned to routes to each neighbor, separately defined for radio port neighbors and RS-232 port neighbors. It is possible using the sysop's ROUTE command to manually set a route at a specified quality. e.g. [Route Port CALL/SSID + VALUE] EXAMPLE: [R 0 K4ABT-7 + 192]

LOS (LINE OF SIGHT)

Descriptive of the use of free-space communications technologies requiring an unobstructed path between transmitter and receiver, as in microwave radio, satellite communications, and infrared optical communications links.

M

MAIL BOX

A personal BBS in a TNC. Sometimes also refers to any personal BBS system handling personal mail. (Also called; Mail Drop, PMS, Personal BBS, PBBS)

MAIL DROP

A part of a TNC program that allows messages to be loaded into the TNC and then retrieved from over the air or from the terminal at the TNC

MARK

One of two possible binary states in data communications. The mark is the resting state in an asynchronous serial system. The negative voltage state on a RS-232 port is called mark. One of the two tone in an AFSK modulation is mark. (See "space" the opposite state). MARK - The signal state on a binary channel representing a "1." Corresponds to current on, hole in paper tape, and (usually) negative voltage, as in EIA RS-232.

MAPPING

In network operations, the logical association of one set of values, such as addresses on one network, with quantities or values of another set, such as devices on a second network; this might be name-address mapping, and internetwork-route mapping. MATRIX - SEE "DIODE MATRIX"

MEGAHERTZ (MHZ)

a unit of a million Hertz; meaning millions of cycles per second of AC current.

MESSAGE

In Packet Radio or telecommunications in general, a complete transmission of data or information. Usually associated with "block" in data communications, as 256 characters.

MFJ - MFJ Enterprises Inc.

MFJ designs, manufactures and markets a wide range of amateur Packet products such as the popular MFJ-1270C TNC (TAPR TNC-2 clone) used for network construction when installing theNET X-1J4 and other network protocol EPROM.

MICROWAVE (M/W)

Radio transmission using very short wave-lengths, corresponding to a frequency of 1,000 megahertz or greater, and not subject to "back-hoe fades."

MIR

Russian (Soviet) space station whose cosmonauts regularly use packet radio to communicate with amateurs around the world.

MODE

This section concerns the X1J4, 17 MODE feature-commands. "See also X1J4 MODE & PARAMETER WEB PAGES" .

MODEM

Contraction of the term Modulator/Demodulator; device that modulates and demodulates signals on and off. Each TNC supports a data modem.

MODEM HEADER

The connector inside a TNC used to connect an external modem to the TNC for higher speed or a different mode of communication. All the data and control lines from the CPU to the modem pass through this connector.

MODULATION

Alterations in the characteristics of analog carrier waves, impressed on the amplitude, phase and/or the frequency of the wave.

MSYS

An amateur packet BBS software written by WA8BXN. Latest Versions also contain DxCluster and conference modes. MSYS has support for TheNET routing and emulates a TheNET node. Note that MSYS's simulation of TheNET is limited by the performance of the PC and may be very poor when the PC is doing BBS operations. The MSYS TheNET emulation features are best utilized as a way to pipe user traffic in and out of the board via the TheNET style node mnemonic.

MTBF (MEAN TIME BETWEEN FAILURE)

A statistical method developed and administered by the U.S. military for purposes of estimating maintenance levels required by various devices and systems.

MULTIPLE ACCESS

In Packet Radio communications, the capability to function as part of the communications link between more than a single station. When accomplished with analog methods, FDMA is the term; if digital, TDMA.

MULTIPLEX/MULTIPLEXING

Transmitting more than a single message simultaneously on a physical transmission path; if analog, the technique is FDM, but if digital it is TDM.

N

NACK/NAK

"Negative Acknowledge" character in many data codes; typically used to indicate receipt of a corrupted message, ordering retransmission; compare to "REJect" character in Packet Radio nodes. Negative AcKnowledgement. A packet or AMTOR ACK response that indicates that the data was NOT received correctly.

NEIGHBOR

In a network of nodes the neighbor of a node is any node that is talked to directly, via the RS-232 port, or via the radio port.

NET/ROM

A proprietary product of Software 2000, that Implements AX-25 at the link layer (L2), with adhoc protocols at the network (L3) and transport layers. Also provides incoming or outgoing regular AX.25 level 2 connections to internal transport layer connections. Provides automatic routing between NET/ROM nodes but the user is still responsible for "source routing" between the end NET/ROM nodes and the ultimate source and destination.

NETWORK

A collection of terminals, computers, peripheral devices, and Packet Radio nodes connected to one another for a defined purpose of Packet Radionetworking. A network is a system of nodes interconnected in such a way that any node can communicate with any other node in the system in an efficient and speedy manner. An example would be a network of user ports wire-linked to backbone nodes that are in turn connected to each other by UHF point-to-point links.

NETWORK INTERFACE

The point of interconnection between one Packet Radio network and another. In most applications it is called a "Gateway."

NETWORK LAYER

Generically, any of several functions in a Packet Radio communications network, such as Terminal, Switching and Transmission. Specifically in the OSI Reference Model, the third layer, servicing the Transport Layer, ensuring that information is properly routed throughout the network. Level 3 of the seven layer OSI communications protocol set. The network layer specifies the communication between adjacent nodes or networks and interfaces with the user at the level 2 link layer and with distant nodes at the level 4 transport layer protocol.

NETWORK TOPOLOGY

Descriptive of the physical and logical relations of nodes in a network; the schematic arrangement of the links and nodes; often classed as star, ring, tree or bus topology; detail variations and hybrid combinations abound.

NETWORK TRUNKS

Long path dedicated links or nodes which interconnect other backbones and LANs.

NETWORK VIRTUAL TERMINAL

A Packet Radio communications concept in which a variety of DTE's with different data rates, codes, speeds, formats and protocols are accommodated on a single network. In such networks, Network Processors convert all into a common format for exchange between processors, then reconvert as needed to output data elsewhere.

NODE/NETWORK NODE

A termination point for Packet Radio communications links; in the sense of Packet Radio communications, a node equipped with an X-1J4 EPROM. An active element in a network, this means any connect, from a user station to a bulletin board. A node in Packet radio is an intelligent router of real time data, somewhat more intelligent than a digipeater but faster than a store and forward BBS. (See TheNET).

NODE BROADCASTS

Each node transmits a message out at quarter or halfhour intervals, depending on the settings the SNO has installed. This message tells theneighbor nodes what nodes are contained in the nodes table. The neighborTheNET nodes interpret this information based on the "quality" setting in the node parameters.

NODE KNOCKING

or Node hopping is denoted as a user who constantly DXes the network by the process of connecting from one node to the next along a path and checking the routes available by reading the nodes table, nodes list and INFOresponse. One of the features of TheNET X-1J4 is that a user may hunt through a network and take advantage of local Routes commands to determine what all ofthe neighbors ofa particular node are. With this knowledge the user may then connect to a neighbor node and repeat the process.

NODE STACK

Two or more nodes on one site interconnected by a diode matrix.

NOISE

Unplanned energy introduced into a communications channel, resulting in transmission errors.

NOS - Network Operating System.

NOS is a program which is generally used to communicate using the TCP/IP protocols but may actually be much more than just a program that does TCP/IP. NOS runs on a personal computer and is the name used to describe many different programs that perform in a similar manner.

NOVRAM

Non-Volatile Random Access Memory, is a memory chip which contains its own power source and holds the present memory, even if the power is removed from surrounding circuitry. External commands provide a means to change the memory. A storage medium that does not lose its contents when power is removed.

NRZ

Non Return to Zero. A binary code format in which binary ones and zeros are represented by two discrete voltage levels and the voltage remains at the indicated level for the duration of the code bit. Compare with bipolar pulse modulation in which the signal would return to an average level between bits. NRZ is the form that most binary signals take within computer circuitry.

NRZI

Non Return to Zero Inverted. A binary code format in which a data 0 (zero) produces a transition (either from 0 to 1 or from 1 to 0) in the code. It does not mean that the NRZI code is merely inverted. The main advantage of

NRZI is that it does not matter at what point in the transmission that one starts to decode, the subsequent data will be the same. The code signal actually sent to the modem and transmitted by an amateur packet TNC, is in NRZI format. At the receive end the TNC converts it back to NRZ format for the CPU to process.

NULL MODEM

A interconnect device or data cable used to connect together two DCE or two DTE digital devices. The RS-232 TXData/RXData and RTS/CTS lines are swapped.

O

OBSOLESCENCE COUNT

In a NET/ROM or TheNET system, each node entry in the nodes table is given an "initial obsolescence count" each time the route is confirmed by a neighbor's node broadcast. The obsolescence count is reduced at regular intervals. When the obsolescence count reaches a predetermined value, the node entry is considered obsolete and is no longer broadcast to its neighbors.

OSI

Open Systems interconnect. The OSI is a project of the International Standards Organization to develop a set of computer communication protocols.

The OSI is a framework with which communications protocols are described.

OVERHEAD

That part of a Packet frame that contains the address, routing, and error-correcting components that support the message delivery to the target station or node. Some node protocols have less overhead than others.

P

PacComm

Packet Radio Systems Inc. PacComm designs, manufactures and markets a range of packet radio products, both amateur and commercial.

PACKET

Amateur AX.25 communications, a structured group of binary digits in a prearranged sequence containing synchronization, address, control an error-checking data. A packet is a block of many characters (or bytes) which are sent together along with a few extra characters (overhear/checksum) used to guarantee that the data is completely error free. The packet includes addressing information so that the receiving station knows the source and destination of the Packet.

PacketCluster

A proprietary software from Pavilion Software. It creates a specialized system for DXers and operates with all users connected in such a way that DX information can be distributed in "real time".

PACKET NETWORK

A network dedicated to the routing and delivery of data through-put in the form of standardized "packets." Example is the SouthEastern Digital Association Networks (SEDAN), an AX.25/X1/X2 network

PACKET SWITCHING

The technique in which a stream of data is broken into standardized units called "packets," each of which contains address, sequence, control, size and error checking information in addition to the user data.

PAD

Contraction of the term Packet Assembler/Disassembler in Packet Switched networks, the instrument that converts data between steady streams and packets. A device that interfaces our computer or "dumb" terminal to an X.25 packet network. It gathers typed characters into outgoing packets and translates incoming packets back into serial asynchronous data streams. Also provides a simple command interpreter for setting up and tearing down connections, controlling parameters, etc. The amateur packet radio TNC was called a "PAD" in the early days of Packet Radio.

PACSAT

An amateur radio satellite carrying a packet store-and-forward node. When launched became OSCAR 16.

PACTOR

PACket Teleprinting On Radio. An HF digital communications protocol developed in Germany. PACTOR combines the best features of both AMTOR and Packet for improved, and more efficient HF data communications.

PARALLEL TRANSMISSION

Simultaneous transmission of all parts of a signal at one time; in data transmission, requiring a separate signal path for each of the bits of a character; internal to computers, this is called a "parallel bus."

PARAMETERS

In TheNET X-1J4 nodeware there is a list of values used by the System Node Operator (SNO) to configure options within the node. These 26 values affect 85 percent of the X-1J4 node personality. The balance of the X-1J4 behavior is controlled by the 17 "MODE" commands. (See also MODE) "See also X1J4 MODE & PARAMETER WEB PAGES"

PARITY

a constant state of equality; one of the oldest and simplest methods of error checking data transmission. Characters are forced into parity (total number of marking bits odd or even as selected by choice) by adding a one or zero bit as appropriate when transmitted; parity is then checked as odd or even at the receiver. For odd parity, a 1 or 0 bit is added to 7 data bits so that the total bit count is an odd number. For even parity, the total bit count is made even with the parity bit. Parity words can similarly used with groups of binary words.

PARITY BIT

a check bit appended to an array of binary digits to make the sum of all the digits always odd or always even.

PARITY CHECK

a checking method that determines if the sum of all the digits in an array is odd or even.

PATH

This word is used to mean the nodes, digis and servers that must be used to pass data from one point to another. Often a path may be specified without including some intermediate nodes if the knowledge of those nodes is not necessary to pass the data or make a connection.

PBBS

Personal Bulletin Board System (see also PMS). Either Personal Bulletin Board System or Packet Bulletin Board System. The former is called personal mail drop or personal mail system (PMS) to avoid confusion. PMS indicate a mail box that is contained inside a normal user TNC, as in "personal message system." A limited function BBS contained within a users TNC firmware with which the user can enter or receive personal messages from other users or from the nearest full service BBS. Usually referred to by one of the commercial trade names such as MailBox, PBBS, PMS, Mail Drop, etc.

PC - Personal Computer.

Usually refers to a computer that is identical in function to a product by IBM that was marketed as an IBM PC. They are more correctly referred to as IBM compatible PC. PC could mean any kind of computer that is used by an individual for general purposes (i.e. Ilot a microwave oven control panel).

It is sometimes hard to determine if a person who mentions PC is referring to a generic personal computer or specifically an IBM PC compatible.

PHYSICAL LAYER

Layer 1 within the OSI Reference Model for Open Systems Interconnection; providing electrical, mechanical and handshaking procedures for transmission.

Example: RS-232 is a Layer One function.

PID

Protocol ID. The first byte of the packet frame which identifies which protocol is used for the packet frame.

PLL

Phase-Locked Loop. A circuit using feedback methods to control the frequency of an oscillator. Usually used as frequency control in synthesized radios.

PM

Phase Modulation. A modulation technique in which the phase of the carrier is changed in relation to the modulating signal.

PMS

"Personal Message System" (See also PBBS)

POINT-TO-POINT

A Packet Radio communications circuit between two terminals only. No intervening node.

POLLING

In packet terms, polling is a collision avoidance method in which one master station queries each of the users on the channel if they have a packet to transmit. The slave stations will not transmit until they have been "polled" by the master station. In this way no two stations will transmit at the same time thus avoiding collisions.

PORT

Entrance or access point to a computer, multiplexor device or Packet Radio network where signals may be supplied, extracted or observed. An input/output channel or connector on a node or TNC. A TNC normally has one or more radio ports hooked to a radio transceiver(s) and a RS-232 or serial port that may be connected to the users terminal (computer) or another node serial port in the case of a TheNET (or other type of higher level node) node stack. A port may also refer to a special purpose node such as a user-port, IP port, backbone port, etc.

PRESENTATION LAYER

The Presentation Layer is where Packet Radio messages that are to be transmitted are grouped, formed, converted to and undergo conversion between computer and the terminal node controller.

PROCESSING DELAY

In Packet Radio communications, the time taken by a computer to operate on an inbound message and return a response; frequently not accounted for in complaints of telecommunications response time problems.

PROM

Programmable Read Only Memory. (See EPROM)

PROPAGATION DELAY/PROPAGATION TIME

The time period between injecting a signal into a communications frequency and its exit at the target end. While not significant to speech, propagation delay can be restrictive to data and Packet.

PROTOCOL

A communications protocol is the set of rules and procedures used to implement a technique or method of communications. The rules for maintaining communications between similar devices. As with AX.25 maintaining orderly error-free data flow and data link control. A set of procedures for establishing and controlling the transmission of information. There are many different protocols for many different purposes. AX.25 is a protocol which describes how small computers can talk to each other. e.g., SDLC; Bisync.

PROTOCOL CONVERSION/PROTOCOL CONVERTER

Generic name and name of the devices that perform a widely variable set of conversions of code, speed, electrical interface and/or block formatting and error checking/correction in data circuits.Example: a packet network TNC operating between an ASCII terminal and a packet network is a form of protocol converter. When the function is to make the line signals of a particular terminal appear like another, the protocol converter is a type called a Terminal Emulator.

PSK - Phase Shift Keying

A data modulation method in which binary data is encoded as discrete changes in the phase of the carrier signal. In amateur packet, PSK is used mainly on OSCAR satellite data communications.

PULSE

In communications, typically a signal characterized by a constant amplitude and duration; the line signal representation of a binary digit.

PULSE CODE MODULATION (PCM)

The form of digital transmission in which information for transmission is sampled at regular intervals and a series of pulses in coded form are transmitted representing the amplitude of the information signal at that time. The most common form of PCM in North America is one in which analog signals of less than 4 kilohertz are sampled 8,000 times per second and converted into an 8-bit code, resulting in 64 kilobits per second for transmission. Twenty-four of these streams are Time Division Multiplexed into a 1.544 megabit stream for T-1 transmission. The European equivalent is 30 channels in a 2.048 megabit stream.

PULSE-LINK REPEATER

Connects two E&M signaling circuits back to back, changing the E of one circuit to the M of the other and vice versa.

PULSE MODULATION

The modulation of a series of pulses to represent information-bearing signals. Typical methods involve modifying the amplitude (PAM), width (PWM), duration (PDM) or position (PPM). Pulse Code Modulation (PCM) is the most common modulation technique involved in telephone work.

Q

QRM

Man-made interference on a radio frequency, intentional or not. QRN Natural interference on a radio frequency. Lightning, solar noise (very week signal work) are examples of natural interference.

QPSK

Quadrature Phase-Shift keying.

QUEUE

A delay in forwarding data or traffic caused by the inability of the system or network to handle the quantity of data being attempted.

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R

RADIO FREQUENCY

A broad part of the electromagnetic spectrum ranging from above audio frequencies to beneath infrared; characterized by the use of antennas to couple signals to the Earth's magnetic field.

RAM

Random Access Memory; That part of a computer or TNC that is holding data, or memory during the power "ON" period. If the RAM has "battery backup" the memory is remains in the RAM until it is changed. If the RAM has no battery backup, no memory remains when power is removed. An IC in a computer that holds data only so long as power is applied. The RAM is usually used only for storage during the execution of a program. TNCs use RAM for temporary storage of messages and parameters. Normally TNC RAM is powered (batttery - backed) all the time using a lithium battery in the TNC.

RASTER/RASTER SCANNING

Providing a means to place information on a screen by sweeping it completely from side to side an top to bottom in a regular fashion. Both CRT tube displays and fax machines utilize forms of raster scanning.

REALTIME

Processes that occur instantly as they occur; closely related to "online. When a signal is sent and a result is expected back with a short enough time to fall within a person's attention span the operation is said to be in Real Time. Keyboard to keyboard operation is real time. Keyboard to server is realtime. Sending a message to a friend via a pack BBS is not real time because the sender doesn't know how long it will be before the reveiver answers back.

RECORD

In data processing, one complete group of logically related information; closely related to "block" and "packet" in communications technology.

RESIDUAL ERROR RATE/UNDETECTED ERROR RATE/LATENT ERROR RATE

The error rate at higher levels of Packet Radio communications system resulting from inability of the error detection/correction methods to trap all errors.

RESPONSE TIME

A measure of time from entering a data field on a remote terminal until the response is delivered to the remote by a central computer; a frequent measure of the overall performance of a Packet Radio Node Network (PRNN).

The time between sending data to a remote device before an expected response returns to the originating station. RETRY - Retry is the process by which a packet that is sent and not acknowledged will be resent by the sending station. This retry is repeated until the acknowledgment is received or until a "retry counter" reaches its limit and the circuit is terminated.

ROM

Read Only Memory. A non-volatile memory IC used to permanently store operating programs in computers and other digital devices. ROMs come in many forms such as FROM (field Programmable ROM), EPROM (Erasable Programmable

ROM), EEPROM (Electrically Erasable Programmable ROM), OTP (One Time

Programmable ROM), etc.

ROM IMAGE

The set of binary data that is programmed into an EPROM.

ROUTE DIVERSITY

Two (or more) Packet channels that assume two physically separate routes. A TheNET type node will substitutes an alternate path if the main path is lost thus preventing total loss of service.

ROUTING

The process of determining or prescribing the path a connection will take through a network of nodes.

ROUTING TABLE

A matrix associated with a Packet Radio network control protocol giving the preferred network link directions beyond that point. (See locked-routes for Packet nodes).

RS-232

A set of signals accepted as a "standard" by the Electronics Industries Association (EIA), designed to make the interfacing of computers and networks, easier. RS-232-C is the current Electronics Industry Association (EIA) standard for the most common signals used between computers. A signal which uses the RS-232 standard is often said to be RS-232. The computer to TNC connection uses RS-232 signals. Normal computer internal data signals use ground and +5 volts to indicate a zero or a one.

RTS - Ready To Send

A control on a RS-232 port that indicated that the device has data ready to send. On some devices the DTR line is used instead of RTS. RTS is often used in conjunction with the CTS signal to engage "hardware handshaking."

RTTY - Radio TeleTYpewriting

An early mechanical based method of data communication on radio using the baudot code. In 1980 ASCII was also permitted on RTTY in the US. TELEX and TWX are commercial telephone systems using the same techniques.

RUDAK

Regenerativer Umsetzer fur Digitale Amateurfunk Kommunikation; Meaning, Regenerating Transponder for Digital Amateur Communications. A packet transponder project flown on board OSCAR 13 satellite. Developed by AMSAT-DL group in Germany.

RXData

Received Data stream produced by a modem demodulator.

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S

SAREX

Shuttle Amateur Radio EXperiment. An educational program in which U.S. Shuttle astronauts communicate with classroom students using voice and packet.

SATURATION

(Sometimes called "GridLock") When related to Packet Radio, this definition refers to the absolute limit of traffic handling that a network of nodes will accept or handle.

SCATTERING

Diffusion of an electromagnetic signal as it passes through a transmission medium; the ultimate cause of signal loss with distance in fiberoptic lightpipes.

SERIAL PORT

The part of a computer responsible for sending binary data in a serial fashion. Normally computers talk intenally with parallel data signals, that is that all of the important bits for a block ofinformation are sent at once. Serial communications uses only one wire which is toggled many times for a single block of information. Thus a letter A might be sent in parallel all at once when it must be sent as a string of ones and zeros in sequence in serial. The serial port usually consists of a single chip called a UART, a RS-232 driver chip and a connector.

SERIAL TRANSMISSION

transmitting data characters or bytes one bit at a time, in sequence. Contrast with: Parallel Transmission.

SERVER

In telecommunications traffic engineering, the generic term for a register or outgoing line that would provide the connection a subscriber demands. In LANs, a processor providing specific services to network users, as a file server to manage orders for file access, a gateway server to manage exit andentry of information to LAN users and similar LAN operations. This may include BBSs, DxClusters, DOSgates, TheNET nodes, TCP/IP hosts etc.

SESSION

Engaging two terminal nodes of a network in a logical connection for information transfer

SHANNON'S LAW

a statement defining the theoretical maximum at which error-free digits can be transmitted over a bandwidth-limited channel in the presence of noise. The rough equation works out to about 10 bits per hertz of bandwidth in practical analog circuits.

SIDEBAND

The resultant added signals above and below a carrier frequency resulting from the modulation process placing information on the carrier. Telephony has in most systems for years filtered out one of the sidebands to save transmission space in AM analog systems. The resulting sideband is called "single sideband." In recent years this same technique has been applied to FM microwave radio as well, resulting in twice the transmission capacity.

SIGNAL

Energy intentionally introduced into a transmission path for the purpose of transmitting information.

SIGNAL TO NOISE RATIO

Ratio of the signal power to the noise power in a specified bandwidth, usually expressed in decibels; the smaller the ratio, the poorer the channel. Generally speaking, a ratio of 20 db or more is a channel subjectively "excellent" for voice, while broadcast television video requires 30 db or more, but 1200 bps can function with only 12 db, requiring greater S/N as the baudrate increases.

SIMPLEX

A channel capable of transmitting in one direction only.

SINGLE SIDEBAND RADIO (SSB)

A form of amplitude modulation of a radio signal in which only one of the two sidebands is transmitted. Either of the two sidebands may be transmitted while the carrier may be reduced or suppressed (see SIDEBAND above).

SMART TERMINAL

A Packet Radio terminal or computer capable of operating in either a conversational or a block mode; containing a full set of local editing capabilities without reliance on a controlling external computer.

SPACE

The communications signal state corresponding to binary zero; represented as no current, no hole in paper tape, (usually) positive voltage. See also "Mark."

SPREAD SPECTRUM

Fundamental to telecommunications, a method of transmitting radio signals as a very wideband but low-powered signal that appears almost like noise. At the receiver all components of the desired signal are filtered from the

noise and summed to recover a usable signal

SSID

The SSID is the specific number applied the call sign of a digipeater or second, third, etc...packet stations. The acronym is derived from the term, "Secondary Station IDentification." It is most often used with nodes of the

TheNET variety. Secondary Station IDentification. In Packet radio, a callsign is normally used as an address. In a applications where an amateur requires more than one address on the air at a time the callsign may be used with an "ssid." There are 16 different possible SSIDs, 0 through 15. An SSID is used when applied to a personal mailbox or PBBS by adding the dash one suffix to the call. Most personal mailbox calls use -1 as the SSID. i.e. the Packet mailbox of K4ABT is K4ABT-1.Below is an example of a few nodes and callsigns of K4ABT and associated SSIDs located in central Virginia.

K4ABT User call of my home Packet station.

K4ABT-1 Mailbox call/SSID at home QTH

K4ABT-2 (223.700 Mhz.) 9600 baud node at Big Island Mtn, VA

K4ABT-3 (223.700 MHz)(145.770 MHz) Gateway/Port SML mountain, VA.

K4ABT-6 (145.770 MHz)(223.700 MHz) Gateway/Port SML mountain, VA.

K4ABT-7 (145.770 MHz) 1200 baud node at Big Island Mtn, VA

K4ABT-9 (440 MHz.) 9600 baud backbone node.

SIMPLEX

A communication method in which communication between two stations takes place one direction at a time regardless of whether the receiving andtransmitting on the same frequency or on split frequency. Amateur radio, simplex usually means receiving and transmitting on the same frequency. Most Packet communications are conducted in "simplex."

SIMPLEX DIGIPEATER

A digital store-and-forward node or digipeater is a regenerative digital repeater that receives a packet, verifies that it was received correctly, and if the Packet is correct, retransmits it on the same frequency it was received on. The node retransmits the signal only after confirming that the frequency or channel is clear.

SITE MANAGER

This is the person or persons who are responsible for node performance relating to hardware maintenance.

SITOR

A commercial communications system very similar to AMTOR and used mainly for maritime and marine mobile communications.

SLIME TRAIL

In Net/ROM and TheNET nodes, transmitted node tables will sometimes show distant nodes that connect through it. The temporary node will be listed at the beginning of the nodes list and will show callsigns only, no alias. This node list entry is called a "slime trail" because you can trace back to see the origin and route of the displayed node.

SLOTTIME

In the persistence method of collision avoidance, slottime is the time delay before repeating the random number persistence calculation. (See persistence)

SPACE

Space, like mark, is one of the two possible states in a binary communications system. In asynchronous serial systems, the start bit is space. On a RS-232 port, the positive voltage level is space.

STA

Special Temporary Authorization. A special permit granted by the FCC to operate using a special application for experimental or test purposes. STA's are also issued to stations for use in applications that are not normally permitted or allowed.

START BIT

The leading bit of every asynchronous character, needed to trigger the receiver that a new character is starting; must intrinsically be a space (0) bit.

STATION

Any user location on a Packet Radio network capable of sending or receiving Packet AX.25 transmissions.

STORE-AND-FORWARD

This is the process employed in nodes and digipeaters where a packet is received, processed, and retransmitted to the next node, digipeater, or destination station.

STREAM

AX25 allows many connections to be made from several stations at the same time. Each connection is called a "stream." To test one's sanity, open more than one stream and allow two or more connections, then carry on separate QSO's with each separately connected station.

SWITCH

Mechanical, electromechanical or electronic devices for making, breaking or changing connections in circuits.

SYNCHRONOUS

A serial communications mode in which the data bits are sent in a continuous stream without character start and stop bits. The data stream is embedded with clocking bits for synchronization at the receive end of the circuit. AX.25 packet communications use synchronous data transmissions.

System Node Operator (SNO)

The person(s) responsible for the contigious operation of a network node. Duties include checking for legal operations. SNO's are not sysop's (See System Node Operator.

SYSOP - or BBS SYSOP

The person(s) responsible for the smooth operation of a BBS, including maintaining forwarding routes, redirecting misaddressed messages, checking for illegal or improper messages. SNO's are not sysop's (See System Node Operator.

SYNCHRONIZATION

Relating to Packet Radio, the function of terminal node controllers to reach equal clocking of data and recognized frames.

SYNCHRONOUS

Having a regular time relationship between successive bits, characters, blocks, frames, messages or other elements. Even so-called "asynchronous" data reaches synchronization during the reception of information bits for each character.

SYSTEM NODE OPERATOR (SNO)

This is the person or persons who have software and hardware control responsibility for node (and digipeater) operations over specific node site(s).

T

TAPR

Tucson Amateur Packet Radio Corp: " non-profit" research group best known for the TNC1 & TNC2 TNCs and their clones. Tucson Amateur Packet Radio, PO Box 12925, Tucson AZ 85732-2925.

TCP

Transmission Control Protocol. A major element of the ARPA suite. TCP Provides the connection oriented byte stream on an end-to-end basis. TCP runs atop IP and is maintained at the transport and session layers.

TCP/IP

Transmission Control Protocol / Internet Protocol. The KISS mode activates this mode in some TNCs. This mode is not supported by software for all computers and Terminal Node Controllers (TNCs). The KISS protocol was used by Phil Karn KA9Q, to develop the Packet radio version of TCP/IP.

TELECOMMUNICATIONS

The transmission of voice and/or data through a medium by means of electrical impulses and includes all aspects of transmitting Packet Radio information.

TELEGRAPH

A system employing the interruption of, or change in, the polarity of signaling to convey coded information. Many of todays techniques in data communications follow precepts first established in telegraphy.

TELEMETRY

Discipline of measuring a quantity or quantities, transmitting the results to a distant point and there interpreting, indicating or recording the quantities measured.

TELENET

A presentation protocol layer in the ARPA & TCP/IP suite used for keyboard to keyboard and keyboard to host communications.

TERMINAL

Relating to Packet Radio, a device capable of sending or receiving information over a Packet Radio frequency. A terminal or display input/output (I/O) device. A Cathode Ray Tube (CRT) normally referred to as a terminal. They are often referred to as "dumb terminals". In most Packet stations our computer is employed as a terminal. A terminal consists of a display screen and keyboard and a connected to an RS-232 port. When you type on the keyboard data is sent out of the Transmit Data pin of the RS-232 connector on the terminal. When Receive Data signals are detected on the RS-232 connector the text is displayed on the screen.

TERMINAL EQUIPMENT

Devices, apparatus and their associated interfaces used to forward dataalong a Packet Radio network or to a target Packet station/terminal (DTE).

TEXNET

A networking node protocol developed by the Texas Packet Radio Society and used primarily in Texas and the southwest. TEXNET uses a custom three port node which supports 1200 or 9600 baud modems, as daughter cards. A notable feature of TEXNET is that it can support a local hard drive using the TEXNET board's on-board disk controller.

TheNET

This is a networking software package created by Hans Giese, DFBAU, and supported by NORD-LINK in Germany. TheNET implements a multi-port, multi-station packet radio network protocol. The latest release of theNET is the X1J4 revised by Dave Roberts G8KBB and is burned into a 27C512. TheNET X1J revision 4 series EPROMs implement a bank-switching technique to enable the use of a larger EPROM thus allowing more features to be added to theNET nodes. DOWNLOAD the X-1J4 Network EPROM Node Code for the MFJ-1270C, and TNC2 CLONES.

TheNET PARMS

TheNET node EPROM's installed in TNCs, operate using timers and other parameters that are burned into the EPROM. Most of these parameters may be modified over the air by the SNO. A complete description of these parms are detailed elsewhere in this book.

THROUGHPUT

A measurement of the number of bits, blocks, characters, messages or interactive transactions passing though a Packet or data communications system. Throughput is usually a number that describes network performance.

Baud rate describes only the number of bit transitions that leave a transmitter in a second. Throughput is a statistic that actually shows the delivery of data in a Packet network, end to end. Throughput is calculated by taking the original baud rate, given in bytes per second, subtracting the overhead and the time used to traverse the network. This includes the time lost due to network protocols, the lost time due to choking and collisions.

TIME DIVISION MULTIPLE ACCESS (TDMA)

a satellite communications technique for sharing use of a satellite transponder by dynamically allocating time slots among its users.

TIME DIVISION MULTIPLEXING (TDM)

Equipment enabling transmission of a number of independent signals over a common path by transmitting them sequentially at different instants of time.

TIME-TO-LIVE

When a packet is sent from one TheNET node to another TheNET node the packet contains several bytes of information which are useful at TheNET nodes along the path. One of these bytes of information is the time-to-live initializer. Each time a node relays the packet one hop further the time-to-live is decremented one node. When it decrements to zero the message is discarded. Therefore, if the number of hops that the packet has to travel (hop) to reach it's specified destination is greater than the initial time-to-live the packet will never reach its destination. In addition, if the time-to-live on the return trip is not high enough an acknowledgment will not be returned.

TINK

The way Doug Sharp K2AD pronounces "TNC."

TIME-SHARING

The sharing of use of a processor among multiple simultaneous users.

TNC

Terminal Node Controller, is the combined modem and packet assembler & disassembler. The interface device between the computer terminal and RF transceiver. The TNC assembles and disassembles packets and provides error detection. The TNC's job is to take text typed on the terminal or computer and store it until the user hits a carriage return . At that time the text is sent to the destination station. Each line of text ending with a carriage return becomes a packet and is stored in the TNC until it can be sent to thedestination station (channel clear).

The TNC has commands that allow the user to set the timing parameters and install the operator's callsign. Once the user has installed the licensed callsign, the TNC adopts its own personality and allows only connect requests directed to the installed call.

TOPOLOGY

(Network) The logical or physical arrangement of nodes on a Packet Radio network in relation to each other. How well a network functions is more related to its topology (the quality of the links and paths) than to the software used to form a network.

TRACE PACKET

(PING) A special test packet in Packet Radio networks that causes a report to be sent back to the network control operator who originated the (ping) test packet.

TRAFFIC

Calls being sent and received over a communications network.

TRANSMISSION

The electrical transfer of a signal, message or other form of information from one location to another; most desirably in unaffected form at the receiver.

TRANSMISSION SPEED

Number of pulses or bits transmitted in a given period of time, expressed variably in Bits Per Second (BPS), Words Per Minute (WPM), Characters per Second (CPM), an occasionally as Lines per Minute (LPM) in WeFAX transmission.

TRANSPARENT

To make the some forms of binary Packet Radio information invisible to otherPacket operators. In Packet communications, a suspension of control character recognition in certain systems while information transfer is in progress. This mode prevents the TNC from reacting to special characters.

Another mode of operation in a packet TNC that allows the sending of all possible binary characters without fear of actuating commands in the TNC. The transparent mode is primarily used for the transfer of binary data files.

TRANSPONDER

Generally, a telecommunications device that receives a signal and relays it in another form.

TRANSPORT LAYER

The fourth layer of the ISO Open Systems Interconnection Reference Model. The "transport" layer performs the function of end-to-end control of transmitted Packet Radio information and is responsible for optimized use of the Packet Radio network resources. It controls the transfer of datagrams between two level 3 nodes via a number of intervening L3 nodes.

TRUNK

A Packet Radio or Packet link between two nodes that are used as backbones.

The trunk is normally a limited access path that allows only nodes or system node operator (SNO) access.

TTL (Transistor-to-Transistor Logic)

An internal transfer standard for electronics devices in which a 1 state is +5 Volts and a zero state is 0 volts. Some TNCs will not accommodate this form of interface. A separate signal converter is required when a TNC does not support TTL. Some TNCs have built-in TTL strapping options or connectors.

TTY (TELETYPE™)

The registered trade name for teleprinters and data terminals of the Teletype Corporation. Used generically in the telecommunications industry for teleprinters or data terminals that emulate teleprinter operations.

TURNAROUND TIME

Time required to reverse the direction on a half-duplex communications channel.

TVRO

Television, Receive Only: The acronym is used to denote the home satellite receiving system.

TXData

Transmit Data stream fed to a modem modulator. (See also, RXData)

TXDelay

The period of time (usually 350 mSec/TXD 35) when TNC issues a transmit command and the actual time the packet data stream begins.

U

UA

Unnumbered Acknowledgment frame. A packet frame sent in unconnected (unproto) mode to acknowledge a connect or disconnect request.

UART

Universal Asynchronous Receiver/Transmitter. This is an IC which is used in a computer to activate a serial port.

UI

Unnumbered information frame. An Information frame without a frame number that is sent as a broadcast during a beacon, nodes broadcast, CQ, and other similar frames. It is not acknowledged and there is no assurance that it will be received.

UNATTENDED OPERATION

Transmission automatically controlled or not requiring a Packet Radio

operator to function. UNPROTO - An unproto packet is a packet transmitted without expecting a response. Technically it is called a UI frame which means Unnumbered Information. A packet station issuing a beacon for all to see or calling CQ, would use an Unproto packet.

UPLINK

That portion of a communications link reaching upward from the Earth to a satellite. In some Packet nodes (X-1J/X2) the "user" command will display the uplink and downlink stations.

V

VADCG

Vancouver Amateur Digital Communications Group. An amateur packet group in Vancouver B.C. responsible for much of the early development our now widely used packet protocols. The early version was called; "the Vancouver Protocol." Much of the amateur packet level 2 protocol was developed in 1979 by Doug Lockhart VE7APU and the VADCG in Vancouver BC.

VIRTUAL CIRCUIT

In a Packet Radio network this term refers to the appearance of a dedicated private channel or connect. In some types of open radio environments theindividual packets may take alternating routes. The service provided by a packet network when two stations are in direct connect. Virtual circuit data packets generally carry less header information than datagrams, since addresses have been specified at the time of the connect setup. Amateur AX.25 packet at level 2 uses virtual circuits.

W

WAN

Wide Area Network: This is a system where many servers and nodes may talk to each other. This kind of system is rugged in that communications would probably not be compromised if a single site went off the air. The maior problem with this methodology is that if the only packet systems available are of this type then users, which present transient loading, will find that the WAN is unable to support massive intermittent loads during peak usage times.

WAVEGUIDE

Physical transmission medium using boundaries of conductors to guide electromagnetic signals; widely used in microwave radio since WWII; closely akin to fiber optic light guide operations.

WEATHER NODE

A weather station linked to a packet radio node for remote monitoring of weather conditions by packet radio. TheNET X-1/X-2 node with ADC options support the addition of windspeed, wind direction, temperature, and rain indicators that can be read by connecting users.

WEFAX

Weather facsimile, reconstructed satellite pictures and photographs. The WEFAX receive mode is now an added feature of the "all mode" digital controllers.

WIDEBAND

A term applied to facilities or circuits where bandwidths are greater than that required for voice.

WINDOWING

A split screen in some computer displays, permitting display of two events simultaneously. In some Packet Terminal programs (BUXTERM, MULTICOM, PCPakRatt, etc) the ability to perform type-ahead data in a "split-screen."

WIRELINE LINK

This is a connection between a pair (or more) of TNCs such that the TNCs communicate via their radio ports but without a pair of radios. The modems are bypassed, thus the TNCs talk at higher data rates than 1200 baud.

WORMHOLE

An amateur packet circuit between two distant points using commercial communication circuits such as telephone, satellite or microwave links.

X

X1J4 NODE CODE

Developed by Dave Roberts G8KBB; The most popular Packet Radio Networking node code in use today. This program is a derivative of the Nord)(Link TheNET node code but has many enhacanced features added plus the functionality to enable allows routing from a TheNET system directly to the Personal mailbox, Personal BBS, BBS, DXCluster or other Packet programs running on the PC.

The latest release of theNET is the X1J4 revised by Dave Roberts G8KBB and is burned into a 27C512. TheNET X1J revision 4 series EPROMs implement a bank-switching technique to enable the use of a larger EPROM thus allowing more features to be added to theNET nodes. DOWNLOAD the X-1J4 Network EPROM Node Code for the MFJ-1270C, and TNC2 CLONES.

X.25

A CCITT standard protocol for the subscriber interface to a public packetswitched network. Consists of two layers, link (level 2) and packet (level 3). The amateur AX.25 protocol is a highly modified version of just the link layer of X.25. X.25 it does not have a packet layer and X.25 is not used in amateur Packet radio.

XON/XOFF

Software handshaking using characters such as Crtl-S/Crtl-Q to turn on and off a communications channel. When the XON/XOFF is defeated with the TNC

XFLOW command set to OFF, the TNC then uses the RTS/CTS signal lines on the

RS-232 port to control data flow thus implementing "hardware handshaking."

Y

YAPP

Yet Another Packet Protocol. A shareware terminal software package to interface a personal computer to a TNC. YAPP contains scrolling, message handling, editing, and other utilities to aid the user on packet. YAPP was written by Jeff WA7MBL.

Z

ZIP or ZIPPED

Data, and other ASCII or Binary files compressed in an encoded manner that enables the data to be stored and transferred in smaller space or less time.

Reference is ZIP or WinZip.

HERE; to return to; The PacketRadio Networking Home Pages.

The SEDAN pages are created by G. E. "buck" Rogers Sr. K4ABT