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Researched and compiled by Joe Cyr (www.joe-cyr.com)

T-RAYS - See TERAHERTZ (THz)

TACAN - An ultra-high frequency electronic air navigation system which provides a continuous indication of bearing and distance (SLANT RANGE) to the TACAN station, common components being used in distance and bearing determination. The term is derived from "TACTical Air Navigation". [1.1]

TACTICAL AIR NAVIGATION - See TACAN.

TACTICAL AUTOMATED MISSION PLANNING SYSTEM (TAMPS) - A computerized method of planning and optimizing aircraft mission routes to hostile targets. []

TACTICAL BUBBLE - A tactical formation, practiced by personnel engaged in Military Operations in Urban Terrain (MOUT), which provides a 'spherical security' environment in which there are no fronts, flanks, or rear. Such a formation is capable of reacting to enemy contact at any point, or multiple points simultaneously. [10:2887] NOTE: For example, inside a building, fire teams must maintain observation of all entries to a room and to the building they occupy so as not to be surprised by enemy movements within the building or reinforcements coming to the building.

TACTICAL CRYPTOLOGIC ELECTRONIC WARFARE SUPPORT MEASURES - CRYPTOLOGIC ELECTRONIC WARFARE SUPPORT MEASURES which supports and is under the direct control of the tactical commander. []

TACTICAL ELECTRONICS INTELLIGENCE (TACTICAL ELINT) - ELINT relating to a) establishing the ELECTRONIC ORDER OF BATTLE prior to a mission; b) updating EW system libraries; or c) directing the operational application of ECM. [10:59] Contrast with STRATEGIC ELECTRONIC INTELLIGENCE.

TACTICAL EXPLOITATION SYSTEM (TES) - A modular down-sized scalable ground station that provides deployed tactical commanders with assured receipt of all-weather, day/night intelligence, surveillance and reconnaissance (ISR) information for national, theater and tactical platforms. TES receives, processes, exploits and disseminates imagery and SIGNALS INTELLIGENCE (SIGINT) data through all phases of military operations, providing a real-time, correlated imagery and SIGINT picture directly to the tactical warfighter. [10:2868] NOTE: TES can be mounted on HMMWVs or 30-foot shelters, and is transportable via C-130 or larger aircraft.

TACTICAL GRID - A SPACE AND ELECTRONIC WARFARE (SEW) concept of a wide area combat direction system (CDS) , a network of small communications links that tie all of the force together regardless of platform or component. [10:2505] See also **COMMUNICATIONS GRID, SURVEILLANCE GRID.**

TACTICAL MILITARY DECEPTION - MILITARY DECEPTION planned and executed by and in support of operational commanders against the pertinent threat, to result in opposing operational actions favorable to the originator's plans and operations. Tactical Military Deception is a category of Military Deception. [1.1] Contrast with **STRATEGIC MILITARY DECEPTION.** See also **DECEPTION, DEPARTMENT/SERVICE MILITARY DECEPTION, ELECTRONIC DECEPTION.**

TACTICAL MISSILE PENETRATOR - A missile which provides high availability and has all-weather, survivability and short response time characteristics. It is designed for destruction of hard and deeply buried targets. [10:2915]

TACTICAL PROPULSION - Solid rocket motors, pyromechanisms and gas generator systems for tactical weapon systems (e.g., rockets and missiles), and cruise missiles. []

TACTICAL RADAR IDENTIFICATION AND LOCATING SYSTEM (TRILS) - A system mounted under armor in the Canadian BISON Light Armoured Vehicle (LAV). The system normally operates in four detachments to form a DF/Intercept baseline. [11.3]

TACTICAL REPEATER SYSTEM - A mobile, manportable radio repeater designed for use by tactical forces, police and first responders to extend the ranges of their digital handheld radios. The 50-pound device contains a duplexer and 20-watt multiband power amplifier. [10:3080]

TACTICAL SUPPORT ESM/ECM - ESM/ECM assets dedicated to the support of group, force, or higher echelon operations. [] Contrast with SELF-PROTECTION ESM/ECM.

TACTICAL TOMAHAWK (TACTOM) - A low-cost follow-on missile to the Tomahawk Land Attack Missile (TLAM). TACTOM is expected (2000) to have an initial operational capability (IOC) in 2003. [10:2840] NOTE: The sixth successful test flight for Tactical Tomahawk took place at White Sands Missile Range on May 16, 2003. The Tactical Tomahawk was launched vertically from a ground test stand that simulated the normal shipboard Vertical Launching System (VLS). It is claimed that all Tomahawk test objectives were successfully demonstrated. The Tactical Tomahawk will field several enhancements, including mission planning aboard the launch platform, in-flight retargeting, loiter and BATTLE DAMAGE ASSESSMENT (BDA) capability, and in-flight health and status reports. These

capabilities increase fleet effectiveness while significantly reducing acquisition and life cycle costs. [11.8]

TACTICAL WARNING - A warning after initiation of a threatening or hostile act based on an evaluation of information from all available sources. [1.1] Contrast with **STRATEGIC WARNING**.

TACTILE SITUATIONAL AWARENESS SYSTEM (TSAS) - A vest containing dozens of small air-pulsed vibrators. A computer tied into the aircraft's own attitude indicator pulses the vibrators that are directly under the pilot relative to the earth, no matter which way is "down" relative to his possibly confused sense. [10:2614] **NOTE:** Other uses of the TSAS include assisting in target or threat location in hostile situations and mapping points in the environment to confirm information about pitch, roll, airspeed and altitude.

TAGGANT - (1) A solid, liquid, or vapor-emitting substance put into explosive material for the purposes of detection or identification. Also known as a **MARKER** or **TRACER ELEMENT**. (2) A chemical marker used to mark documents by incorporating covert substances into the printing medium (primarily toner) so that they are virtually undetectable to the unaided human eye. Special scanners are used to detect the photo-optical characteristics of the applied taggant. (3) A forensic fluid, similar to DNA, that can be applied to the surface of an asset such as a tool or equipment component.. The taggant material sinks beneath the surface and bonds with the object at the molecular level so that removal of the mark is extremely difficult without obvious damage to the asset. (4) A sample scent used to cue odor-sniffing dogs. [] See also **CODED FLUID**; **SMART WATER**. **NOTE:** The first type of **TAGGANT** listed above consists of two sub-types: **DETECTIVE TAGGANT**, which identifies the explosive in its undetonated form, and **IDENTIFICATION TAGGANT**, which is used to identify the explosive material from residue after detonation.

TAIL-TO-TOOTH RATIO - See **TOOTH-TO-TAIL RATIO**

TAIL WARNING FUNCTION (TWF) - A defensive system consisting of a **PULSED DOPPLER RADAR** to detect missiles which are approaching the aircraft from behind and the means to dispense defensive countermeasures to defeat the missile attack. [10:2828]

TARGET - In radar, (a) generally, any discrete object which reflects or retransmits energy back to the radar equipment; (b) specifically, an object of radar search or surveillance. [1*] **NOTE:** In this context, the term "target" is used in a benign sense, and does not necessarily refer to a military target.

TARGET ACQUISITION - The detection, identification, and location of a target in sufficient detail to permit the effective employment of weapons. [1.1]

TARGET ANALYSIS - An examination of potential targets to determine military importance, priority of attack, and weapons required to obtain a desired level of damage or casualties. [1.1]

TARGET ANGLE - The relative bearing of the reference point from the target. For example, if a ship is at the 9 o'clock position from a given aircraft, then the target (from the viewpoint of an observer on the ship) is 270 degrees; if the aircraft is heading toward the ship, then the target angle is 360 degrees. []

TARGET AREA JAMMING SUPPORT - An ECM tactic in which the jamming aircraft flies directly to the target area to jam defensive systems immediately around the target's perimeter. It includes **STAND-OFF JAMMING SUPPORT**, **CLOSE-IN JAMMING SUPPORT**, and **DIRECT JAMMING SUPPORT**. [10:2521] See also **AREA JAMMING SUPPORT**, **CORRIDOR JAMMING SUPPORT**.

TARGET CLASSIFICATION - Distinguishing between categories of platform: ship vs. aircraft; friendly vs. neutral vs. hostile; combatant vs. non-combatant. [10:87] Compare with **TARGET IDENTIFICATION**.

TARGET DESIGNATION - The selection of targets that are to be taken under fire and the transmission of the required information for acquisition to the selected fire control station or stations. It may be classified by originating station or by means used. [6]

TARGET DISCRIMINATION - The ability of a surveillance or guidance system to identify or engage any one target when multiple targets are present. See also **BEARING RESOLUTION**, **RANGE RESOLUTION**.

TARGET IDENTIFICATION - Determining the name or hull/aircraft number of a target. [10:87] Compare with **TARGET CLASSIFICATION**. See also **INDIRECT TARGET IDENTIFICATION**, **NON-COOPERATIVE TARGET IDENTIFICATION**.

TARGETING - The process of selecting targets and matching the appropriate response to them taking account of operational requirements and capabilities. [1.1]

TARGET INTELLIGENCE - Intelligence which portrays and locates the components of a target or target complex and indicates its vulnerability and relative importance. [1.1]

TARGET RESOLUTION AND DISCRIMINATION EXPERIMENT (TRADEX) - A high power radar located on the island of Kwajalein in the western Pacific. Originally designed to track and gather signature data on a single target, TRADEX now has two missions: Anti-Ballistic Missile (ABM) testing in support of the Western Space and Missile Center (WSMC) and space surveillance. [10:2804] NOTE: TRADEX is one of the 25 sites worldwide of U.S. Army, Navy and Air Force operated ground-based radars and optical sensors composing the Space Surveillance Network. Two other radars are the ARPA Long-range Tracking and Identification Radar (ALTAIR) and the ARPA Lincoln C-Band Observable Radar (ALCOR).

TARGET SIGHT SYSTEM - An advanced ELECTRO-OPTIC / INFRARED (EO/IR) system consisting of a suite of high-performance sensors which provides target detection, recognition and identification at extremely long ranges during day and night operations. [10:2683]

TARGET SIGNATURE - The characteristic pattern of a target displayed by detection and identification equipment. [1.1] See also SIGNATURE CONTROL.

TASER® - A trademark (Registered trademark of TASER International, Inc.) used for a high-voltage stun-gun. [*TASER International*] See also NONLETHAL WEAPON.

TECHNICAL CHARACTERISTICS - Those characteristics of equipment which pertain primarily to the engineering principles involved in producing equipment possessing desired military characteristics, e.g., for electronic equipment, technical characteristics include such items as circuitry, and types and arrangement of components. [1.1] Contrast with OPERATIONAL CHARACTERISTICS.

TECHNICAL INFORMATION - Information, including scientific information, which relates to research, development, engineering, test, evaluation, production, operation, use, and maintenance of munitions and other military supplies and equipment. [1.1]

TECHNICAL INTELLIGENCE - Intelligence concerning foreign technological developments, and the performance and operational capabilities of foreign material, which have or may eventually have a practical application for military purposes. [1.1]

TECHNICAL SPECIFICATION - A detailed description of technical requirements stated in terms suitable to form the basis for the actual design development and production processes of an item having the qualities specified in the operational characteristics. [1.1] See also OPERATIONAL CHARACTERISTICS.

TECHNOLOGICALLY FEASIBLE THREAT (TFT) - An excursion from the PROJECTED THREAT intended to provide decision makers with a basis for

judgment about the impact on a specific U.S. system if the THREAT evolves in a direction other than that considered most likely by the intelligence community. The TFT, although not constrained by the intelligence projections, must be consistent with an adversary's technology, production capacity, and economic capability. []

TEFLON CONFETTI - A NONLETHAL WEAPON which is a granulated form of ANTI-TRACTION LUBRICANT. []

TELECOMMUNICATION - Any transmission, emission, or reception of signs, signals, writings, images, sounds, or information of any nature by wire, radio, visual, or other electromagnetic systems. [1.1]

TELEDESIC SYSTEM - A constellation of 288 low-earth-orbit (LEO) satellites in 12 different planes forming a data network. Envisioned for circa 2002, it will be an "Internet in the sky." [10:2621]

TELEMATICS - The convergence of telecommunications and computing. []

TELEMETRY INTELLIGENCE (TELINT) - Technical and intelligence information derived from the intercept, processing, and analysis of foreign telemetry. Telemetry intelligence is a category of FOREIGN INSTRUMENTATION AND SIGNALS INTELLIGENCE. [1.1]

TELE-OPERATED VEHICLE (TOV) - A remotely operated vehicle operated from a remote location with fiber-optic cable and an RF backup. [10:53]

TELEPRESENCE - The viewing of remote locations through cameras mounted on robots. [10:2683] NOTE: Telepresence is similar to virtual reality.

TELEPRESENT RAPID AIMING PLATFORM (TRAP) - A lightweight (approximately 20 pounds), tripod-based recoil and accuracy stabilized platform for weapons up to .50 caliber size. It is equipped with both through-sight and surveillance cameras and can employ various sensors such as thermal and passive night vision. TRAP can be operated remotely via cable hookup from up to 100 meters. [Military.com 07/04/04]



TELERAN - A navigational system which (a) employs ground-based search radar equipment along an airway to locate aircraft flying near that airway; (b) transmits, by television means, information pertaining to these aircraft and other information to the pilots of properly equipped aircraft; and (c) provides information to the pilots appropriate for use in the landing approach. [1.1]

TELESCOPED AMMUNITION - See **CASED TELESCOPED AMMUNITION**.

TELESTRATOR - A device used to draw lines and diagrams on the television screen, such as highlighting instant replays in sports. Also called **JOHN MADDEN PENCIL**.
.[1]

TELEVISION IMAGERY - Imagery acquired by a television camera and recorded or transmitted electronically. [1.1]

TELEVISION RANGING AND NAVIGATION - See **TELERAN**.

TEMPEST - (Transient Electromagnetic Pulse Emanations Standard) A National Security Agency (NSA) program which governs the development, test, and operation of electronics used in highly classified projects. [5:3]

TENTATIVE OPERATIONAL REQUIREMENT (TOR) - An acquisition document consisting of a cover sheet plus a maximum of 3 pages and no attachments. A TOR emphasizes key capabilities - in general terms without goals or thresholds - and affordability; it must address EMC and frequency spectrum planning, and contain an estimate of what the Resource Sponsor is willing to pay. [10:7]

TERABYTE (TB) - (1) 10^{12} BYTES. (2) 2^{40} or BYTES. [] ALSO CALLED "tebibyte."
NOTE: In 1999, the International Electrotechnical Commission (IEC) introduced the "base 2" prefixes kibi-, mebi-, gibi-, tebi-, pebi-, exbi-, to describe numbers, such as those for indicating computer disc capacities.. The names come from the first two letters of the original SI (International System of Units) prefixes to which is appended *bi* ("binary").

TERAHERTZ (THz) - A trillion (10^{12}) Hertz. This radiation lies between the INFRARED (IR) and microwave (MW) regions of the ELECTROMAGNETIC SPECTRUM. Also called T-RAYS. [] NOTE: THz allow the sensing of objects by both traditional means of reflection (imaging) and by being able to transmit or look through objects. Among the uses (*ca* 2005) of T-rays: standoff detection of chemical and biological agents, explosives, and weapons; screening of humans, non-destructive testing of aircraft and spacecraft, non-invasive medical diagnostics, far-space telescopes, industrial process control, and broadband communications.

TERAHERTZ OPERATIONAL REACHBACK (THOR) - A program (*ca* 2002) intended to exploit the vast terrestrial fiber infrastructure by merging it with free space laser communications links in order to give the deployed commander exceptionally high data rate connectivity back to the U.S. With THOR, the deployed commander can minimize his in-theater footprint and still have access to the highest fidelity and most timely information. [] NOTE: In effect, THOR will be a high-flying optical wireless network which will allow, among other things, the ability to transfer data files of images that are typically too large for conventional wireless networks.

TERMINAL DEFENSE - Defensive actions taken by an intended target in its own vicinity. [] See also COUNTER-HOMING and COUNTER-FUZING.

TERMINAL THREAT WARNING - An alert (alarm) resulting from essentially instantaneous intercept and identification of an electromagnetic signal associated with the launch, or imminent launch, and subsequent flight of a missile. []

TERRAIN AVOIDANCE SYSTEM - A system which provides the pilot or navigator of an aircraft with a situation display of the ground or obstacles which project above either a horizontal plane through the aircraft or a plane parallel to it, so that the pilot can maneuver the aircraft to avoid the obstruction. [1.1] See also TERRAIN CLEARANCE SYSTEM, TERRAIN FLIGHT, TERRAIN FOLLOWING SYSTEM.

TERRAIN BOUNCE - See BOUNCE JAMMING.

TERRAIN CLEARANCE SYSTEM - A system which provides the pilot, or autopilot, of an aircraft with climb or dive signals such that the aircraft will maintain a selected height over flat ground and clear the peaks of undulating ground within the selected the selected height in a vertical plane through the flight vector. This system

differs from terrain following in that the aircraft need not descend into a valley to follow the ground contour. [1.1] See also TERRAIN FLIGHT, TERRAIN AVOIDANCE SYSTEM, TERRAIN FOLLOWING SYSTEM.

TERRAIN FLIGHT - Flight close to the earth's surface during which airspeed, height and/or altitude are adapted to the contours and cover of the ground in order to avoid enemy detection and fire. Also called NAP-OF-THE-EARTH FLIGHT. [1.1] See also TERRAIN AVOIDANCE SYSTEM, TERRAIN CLEARANCE SYSTEM, TERRAIN FOLLOWING SYSTEM.

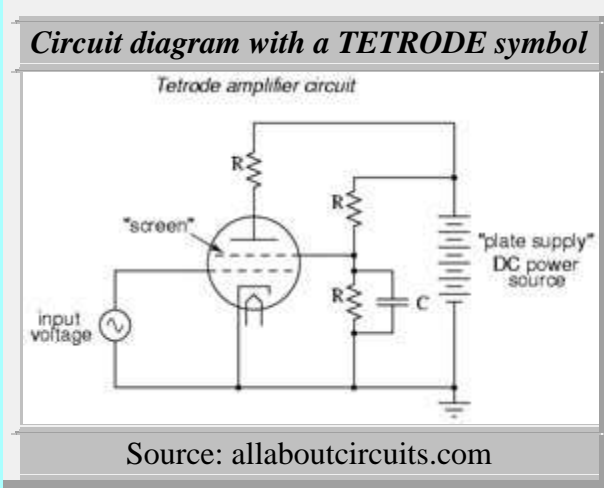
TERRAIN FOLLOWING SYSTEM - A system which provides the pilot, or autopilot, of an aircraft with climb or dive signals such that the aircraft will maintain as closely as possible, a selected height above a ground contour in a vertical plane through the flight vector. [1.1] Contrast with TERRAIN CLEARANCE SYSTEM. See also TERRAIN AVOIDANCE SYSTEM, TERRAIN FLIGHT.

TERRESTRIAL PLANET FINDER (TPF) - A space borne system intended to search for, detect and characterize earth-like planets using a suite of precision optical and spectroscopy instruments to study the brightest 1,000 stars in our solar neighborhood and to look for celestial bodies displaying such signs of life as water, carbon dioxide, ozone and methane. [10:2810]

TERRORISM - The unlawful use or threatened use of force or violence against individuals or property to coerce or intimidate governments or societies, often to achieve political, religious, or ideological objectives. [1.1]

TETHERED SATELLITE - A half-ton research satellite connected to a space shuttle with a thin tether about 13 miles long. One possible use is to generate electricity in orbit as the tether passes through the Earth's magnetic field. [10:2553]

TETRODE - A VACUUM TUBE containing four elements: CATHODE, two GRIDS, and a plate (ANODE). [] See also DIODE, PENTODE, TRIODE.



TEXT MESSAGING - An informal communications shorthand used in Internet chat rooms, "instant messaging" and sometimes in e-mail messages. Examples of text messaging abbreviations appear in the table below. A more comprehensive listing may be found at www.webopedia.com. []

TEXT MESSAGING ABBREVIATIONS					
Source: Webopedia.com					
Abbreviation	Meaning	Abbreviation	Meaning	Abbreviation	Meaning
AEAP	As early as possible	GA	Go ahead	TAFN	That's all for now
AFK	Away from keyboard	GB	Goodbye	TAM	Tomorrow a.m.
ATM	At the moment	GL	Good luck	TBD	To be determined
AYEC	At your earliest convenience	IC	I see	THX	Thanks
B4	Before	IDK	I don't know	TMI	Too much information
B4N	Bye for now	IOW	In other words	TPM	Tomorrow p.m.
BAK	Back at keyboard	L8R	Later	TTYL	Talk to you later
BBL	Be back later	NLT	No later than	TTYSS	Talk to you soon
BBS	Be back	NRN	No	TU or TY	Thank you

	soon		response/reply necessary		
D/L	Download	OTOH	On the other hand	UL	Upload
EMA	E-mail address	PLMK	Please let me know	UR	Your / You're
EOD	End of day	PLZ	Please	WK	Week
EOM	End of message	PXT	Please explain that	YW	You're welcome
FYEO	For your eyes only	STW	Search the Web		
FYI	For your information	SUL or SYL	See you later		

THEATER BATTLE MANAGEMENT CORE SYSTEM (TBMCS) - A system which integrates previously discrete applications such as force and unit-level operations and intelligence systems into a common-core systems environment to give users an integrated command and control system for carrying out air campaigns. [10:2785]

THEATER HIGH-ALTITUDE AERIAL DEFENSE (Thaad) - A theater missile defense system using a hit-to-kill warhead for upper-tier, or mid-course, defense in the **BALLISTIC MISSILE DEFENSE (BMD)** concept. [10:2606] Thaad is intended to destroy a maneuvering ballistic missile by hitting it dead on, above the atmosphere, with a ground-launched missile. It relies on the impact of a non-explosive interceptor stage propelled from its booster. [10:2635] See also **AIRBORNE LASER (ABL)**.

THEATER INJECTION POINT SYSTEM (TIPS) - A mobile satellite broadcast management and uplink system that transmits high speed data, voice and video files to the battlefield. [10:2968] **COMMENT:** TIPS sends specific scheduled information to designated units only, saving time when crucial decisions must be made by warfighters.

THERMAL BLOOMING - A phenomenon that can degrade **LASER** performance. When a laser beam heats cool air, the air column expands radially outward, and air density along the central axis drops. As the beam travels hundreds of kilometers through non-uniform air, it diverges, as if passing through lenses. The greater the divergence, the less power the beam can deliver. [10:2607]

THERMAL CROSSOVER - The natural phenomenon which normally occurs twice daily when temperature conditions are such that there is a loss of contrast between two adjacent objects on infrared imagery. [1.1]

THERMAL DETECTOR - A device which converts invisible electromagnetic energy into voltages or resistive changes, so that these may be made apparent to the human observer or other device (such as movement of a needle, sounding of an alarm, computer display, etc.). [10:2574] See also **THERMAL IMAGING**, **THERMAL WEAPON SIGHT**. NOTE: Thermal detectors include bolometers, thermistors, thermocouples, thermopiles and pyroelectric devices.

THERMAL GUN - A microwave device, which may or may not be a **NONLETHAL WEAPON**, that can create heat in the human body, generating very high fevers, acute illness, and even death. [10:2730] See also **ACOUSTIC WEAPON**.

THERMAL IMAGING - (1) The sensing and recording of the thermal energy emitted or reflected from the objects which are imaged. [1*] (2) The detection of emitted infrared energy from both target and background, the conversion of the infrared wavelengths to the visual spectrum, and the presentation of the observed scene on a television monitor in real time. Thermal imaging allows one to see in total darkness and through mist or smoke without being blinded by the glare of the sun, muzzle flashes, flares or searchlights. [10:11] See also **LIGHT AMPLIFICATION**, **INFRARED IMAGING**, **UNCOOLED THERMAL IMAGERY**.

THERMAL SHADOW - The tone contrast difference of infrared linescan imagery which is caused by a thermal gradient which persists as a result of a shadow of an object which has been moved. [1.1] See also **INFRARED IMAGERY**, **INFRARED LINESCAN SYSTEM**.

THERMAL WEAPON SIGHT (TWS) - AN **INFRARED (IR)** device which can provide vision through complete darkness, adverse weather conditions, blowing dust and smoke. The TWS utilizes several modern technologies to fulfill the lightweight, low-power, rugged infrared sensor requirements: silent-running, thumbnail-sized thermoelectric cooler, binary optics requiring 40% fewer lens components, low power **LIGHT-EMITTING DIODE (LED)** display, and **VLSI** electronics. [10:2548]

THERMIONIC EMISSION - The liberation of electrons or ions from a solid or liquid as a result of its thermal energy. [3] See also **CATHODE**, **VACUUM TUBE**.

THERMITE GRENADE - See **INCENDIARY GRENADE**

THERMOBARIC WEAPON - Thermobaric weapons distinguish themselves from conventional weapons by using atmospheric oxygen, instead of carrying an oxidizer in their explosives, and produce more explosive energy for a given size than do other explosives. Some thermobaric weapons work by first expelling a cloud of explosive mist using a small charge, then igniting it with a second charge. These thermobaric weapons consist of a container of a volatile liquid (or a finely powdered explosive or a metal powder) and, typically, two separate explosive charges. After the munition is dropped or fired, the first explosive charge (or some other dispersal mechanism) bursts open the container at a predetermined height and disperses the fuel in a cloud that mixes with atmospheric oxygen. Once the fuel is appropriately mixed, the second charge detonates, propagating an explosion (blast wave) through the cloud.

[military.com] Also called **FUEL AIR EXPLOSIVE (FAE or FAX), FUEL-AIR MUNITIONS, HEAT & PRESSURE WEAPON, HIGH-IMPULSE**

THERMOBARIC (HIT) WEAPON, VACUUM BOMB. NOTE: Thermobaric weapons were first developed in 1970, by the Soviets. One is called the RPO-A Shmel (Bumblebee), and is a disposable shoulder-fired thermobaric weapon. :

THERMOELECTRIC (TE) MODULE - See **PELTIER DEVICE**

THERMOVIEWER - A device, about the size of a pair of binoculars, that can "see" in absolute darkness. It creates images by sensing minute temperature differences between the object sought and its background, and was designed to find enemy troops and vehicles at night. [10:2746]

THIN FILM PYROTECHNICS - CD destruction systems consisting of pyrotechnic sheets glued onto media (e.g., CD-ROM) that can be ignited to catastrophically destroy the data-holding portion of the media. [10:2639]

THIRD GENERATION LANGUAGE (3GL) - A programming language that includes features such as nested expressions, user-defined data types, and parameter passing not normally found in lower-order languages, that does not reflect the structure of any one given computer or class of computers, and that can be used to write machine independent source programs. [3*] Synonymous with **HIGH-ORDER LANGUAGE**. See also **FIRST-GENERATION LANGUAGE, SECOND GENERATION LANGUAGE, FOURTH GENERATION LANGUAGE**.

THIRD GENERATION RADAR SIGNAL - A generic classification of radar signal sophistication. Third generation radar signals feature **SPREAD SPECTRUM**, pulse, Doppler, and operation in the A through K bands of the **ELECTROMAGNETIC SPECTRUM**. [10:34] See also **FIRST, SECOND, and FOURTH GENERATION RADAR SIGNAL**.

THIRD MILITARY TECHNICAL REVOLUTION - See **REVOLUTION IN MILITARY AFFAIRS (RMA)**.

THREAT - (1) The sum of the potential strength, capabilities, and intentions of any enemy which can limit or negate mission accomplishment or reduce force, system or equipment effectiveness. (2) A menacing indication of danger to a nation's military forces, industrial base, territory, possessions, or population. (3) A menacing indication of imminent danger to friendly forces. [] **NOTE:** A threat in the sense of definition (2) generally arises from an adversary nation's military power manifested by technological capability, military budget, military industrial production capacity, military alliances, and the maintenance of conventional and strategic forces at levels beyond that required for legitimate defense. A threat in the sense of definition (3) generally arises from the employment of an adversary's offensive or defensive forces in an area of military operations. See also **PROJECTED THREAT**, **TECHNOLOGICALLY FEASIBLE THREAT (TFT)**

THREAT KILL CHAIN - The sequence of events that must occur for a threat to successfully engage and kill its target (*e.g.*, an aircraft). [10:2819] **NOTE:** Threat kill chain elements include **SURVEILLANCE**, **IDENTIFICATION**, acquisition, guidance, and **ENDGAME**. See also **KILL CHAIN**.

THREAT SYSTEM CHANGE - Any change in electromagnetic parameters and/or operating procedures of a threat system which causes it to: (1) not be recognized as that system by intelligence collection or **ELECTRONIC WARFARE SUPPORT** systems, or (2) not be recognized or countered by **ELECTRONIC WARFARE** systems that normally would do so. Such changes may be intentional or unintentional, and may or may not be the result of employment of **WARTIME RESERVE MODES**. [7:CJCS MOP 6, APPENDIX B]

THREAT WARNING - (1) A visual, aural, or tactile indication of imminent danger. (2) A mission area in which electronic warfare systems provide platform threat warning or targeting support through passive reception of electromagnetic energy. [] See also **MISSION SUPPORT**, **SELF-PROTECTION**.

THROUGH VIA - See **VIA**.

THROUGH-WALL RADAR - A hand-held (or tripod-mounted) detection device employed to transmit low-frequency ultra-wideband (UWB) **IMPULSE** radar pulses that can pass through building materials over 40-cm thick, to detect activity over a range of up to 15 meters. [10:3070] **NOTE:** Employing the device's 3D object location and motion tracking features, operators can decide whether persons are standing, sitting, or lying, and are able to distinguish between humans and animals. The device may be held against a wall, or up to two meters away.

THROWBOT - A reconnaissance robot, weighing less than a pound and the size of a soft-drink can, designed to be tossed into windows and through doorways. The Throwbot is equipped with a video camera, and is controlled by a hand-held unit to scout ahead for booby traps and ambushes in urban operations. [10:3098]



Throwbot

THUNDER ROD STUN GRENADE - A **NONLETHAL WEAPON** made to be insertable through holes in doors. It produces a loud blast and an intense flash of light. [10:2745]

THUNDERSTRIP STUN MUNITION - A **NONLETHAL WEAPON**, which can be slid under a door, used to produce a blast that will stun individuals inside a room or enclosure. [10:2745]

TIME BOMB PROGRAM - A **MALICIOUS SOFTWARE** program or **VIRUS** triggered at a specific date or time. [] See also **LOGIC BOMB**.

TIME DIVISION DUPLEXING (TDD) - The use of time to separate transmit and receive signals on a single frequency, as compared to **FREQUENCY DIVISION DUPLEXING (FDD)**, which employs two frequencies for the transmit and receive functions. [10:2708]

TIME-DOMAIN REFLECTOMETRY (TDR) - A REFLECTOMETRY technique using rectangular pulses. TDR sends a short pulse down the cable; the cable's length, impedance and termination provide a unique signature. A trained technician can detect faults by observing deviations from the cable's "normal" signature. [10:2871] See also **SMART WIRE, FREQUENCY DOMAIN REFLECTOMETRY (FDR) and STANDING WAVE REFLECTOMETRY (SWR).**

TIME-FREQUENCY ANALYSIS - The decomposition of a signal into components with a range of locations, durations, and frequencies. Time-frequency analysis, which employs **WAVELET** packets, is used to visualize how the frequency behavior of a signal changes over time. [10:2588]

TIME HOPPING - (TH) A SPREAD SPECTRUM technique in which data bits are shortened to a small fraction of their original duration and placed pseudorandomly in the original data bit slot. Since the intended receiver of the data knows the details of the pseudo- random spreading code, it can use matched filter detection of the spread signal to supply an exact replica of the transmitted signal except for the values of the data bits themselves. [10:21] Contrast with **DIRECT SEQUENCE SPREADING, FREQUENCY HOPPING.**

TIN WHISKERS - Electrically conductive crystalline structures of tin that sometimes grow from surfaces where tin (especially electroplated tin) is used as a final finish. About one micron in diameter, **TIN WHISKERS** may grow in length from several mm to 10 mm. Numerous electronic system failures have been attributed to short circuits caused by tin whiskers that bridge closely-spaced circuit elements maintained at different electrical potentials. **NOTES:** (1) Tin is only one of several metals that is known to be capable of growing whiskers. Other metals that may form whiskers include Zinc, Cadmium, Indium and Antimony. (2) Whiskers are very different phenomena from dendrites. A "Whisker" generally has the shape of a very thin, single filament or hair-like protrusion that emerges outward (z-axis) from a surface. "Dendrites", on the other hand, form in fern-like or snowflake-like patterns growing along a surface (x-y plane) rather than outward from it. The growth mechanism for dendrites is well-understood; it requires some type of moisture capable of dissolving the metal (*e.g.*, tin) into a solution of metal ions which are then redistributed by electromigration in the presence of an electromagnetic field. While the precise mechanism for whisker formation remains unknown, it is known that whisker formation does **NOT** require either dissolution of the metal **NOR** the presence of electromagnetic field. (3) Component failures due to whiskers include **stable short circuits in low voltage, high impedance circuits, transient short circuits**, and the very destructive metal vapor arcs which can carry hundreds of Amperes for several seconds until interrupted by fuses or circuit breakers. (Metal vapor arcs in vacuum are reported to have occurred on at least three commercial satellites resulting in blown fuses that rendered the spacecraft non-operational). (4) Whiskers or parts of whiskers may break loose and bridge isolated conductors or interfere with optical surfaces (5) Whiskers, which have "incubation periods" from days to years, may be straight, kinked, hooked or forked. Their outer surfaces are often grooved. Some growths may form as nodules or pyramidal structures. Growth rates from

0.03 to 9 mm/yr have been reported. [Source: NASA Tin Whisker (and other metal whisker) Home Page – <http://nepp.nasa.gov/whisker/index.html>]

TISSUE-BASED BIOSENSORS - Sensors which use cells and tissues to detect biological threats in the environment. NOTE: Such cells will be able to differentiate between pathogenic and non-pathogenic species as well as separate live from dead pathogens. [10:2955]

TONE DOWN - In camouflage and concealment, the process of making an object or surface less conspicuous by reducing its contrast to the surroundings and/or background. [1.1] See also YEHUDI.

TOOTH-TO-TAIL RATIO - The percentage of spending on military combat capability relative to support. [10:3026] Also called **TAIL-TO-TOOTH RATIO**. NOTE: For example, if personnel, systems and support in the hands of operational combat forces constituted the "tooth," then the "tail" would be everything else (*e.g.*, data processing, accounting, housing, health care, education, *etc.*...)

TOP LEVEL WARFARE REQUIREMENT (TLWR) - The required operational capability necessary to accomplish the naval missions embodied in the maritime strategy across the full threat spectrum. []

TOROIDAL VOLUME SEARCH SONAR (TVSS) - A SONAR, employed by **UNMANNED UNDERWATER VEHICLES (UUVs)** in mine detection. TVSS produces a 360-degree beam pattern to provide volume search as well as surface and bottom coverage with narrow beamwidth patterns. [12.1]

TOTAL INFORMATION AWARENESS (TIA) - A new (2002) DARPA program. The purpose of the TIA program is to revolutionize the ability of the United States to detect, classify and identify foreign terrorists, and to decipher their plans, thereby enabling the U.S. to take timely action to successfully preempt and defeat terrorist acts. To that end, the TIA program objective is to create a counter-terrorism information system that: (1) increases information coverage by an order of magnitude, and affords easy future scaling; (2) provides focused warnings within an hour after a triggering event occurs or an evidence threshold is passed; (3) can automatically queue analysts based on partial pattern matches and has patterns that cover 90% of all previously known foreign terrorist attacks; and, (4) supports collaboration, analytical reasoning and information sharing so that analysts can hypothesize, test and propose theories and mitigating strategies about possible futures, so decision-makers can effectively evaluate the impact of current or future policies and prospective courses of action. [www.darpa.mil/iao/TIASystems.htm] NOTE: The TIA program strategy (2002) is to integrate technologies developed by DARPA (and elsewhere as appropriate) into a series of

increasingly powerful prototype systems that can be stress-tested in operationally relevant environments, using real-time feedback to refine concepts of operation and performance requirements down to the component level.. . The Information Awareness Office logo appears below:



The table below lists some of the component programs of TIA:

<i>INFORMATION AWARENESS OFFICE (IAO) PROGRAMS</i>
Babylon
Bio-Surveillance
Communicator
Effective, Affordable, Reusable Speech-to-Text (EARS)
Evidence Extraction and Link Discovery (EELD)
FutureMap
Genisys
Genoa
Genoa II
HumanID
Translingual Information Detection, Extraction and Summarization (TIDES)
Wargaming the Asymmetric Environment

(WAE)

Source: Defense Advanced Research Project Agency (DARPA) (2002)

TOWED ARTILLERY DIGITALIZATION (TAD) SYSTEM - A detachable computer system that can be removed from its associated howitzer during tactical movement. When installed, the computer allows the computer to be surveyed into position autonomously. The TAD provides the capability to navigate, locate, and orient itself and computes its own firing data. []

TOWED DECOY - A SELF-PROTECTION device containing a jammer which is deployed and towed by an aircraft to create a false target. [] Also called **MISSILE MAGNET** or **LITTLE BUDDY**.

TRACER – An aircraft-carried (*e.g.*, C-12 Huron aircraft) low frequency, synthetic aperture radar capable of detecting objects that are buried, camouflaged or concealed to provide real-time, high-quality tactical ground imagery to the warfighter. TRACER also incorporates data link capability that allows airborne processed results to be linked immediately to portable ground stations. [10:3125] NOTE: TRACER is employed in counter-terrorism, humanitarian assistance, and disaster relief operations missions.

TRACER ELEMENT - See TAGGANT

TRACK - (1) A series of related contacts displayed on a plotting board. (2) To display or record the successive positions of a moving object. (3) To lock onto a point of radiation and obtain guidance therefrom. (4) To keep a gun properly aimed, or to point continuously a target-locating instrument at a moving target. (5) The actual path of an aircraft above, or a ship on, the surface of the earth. The course is the path that is planned; the track is the path that is actually taken. [1.1]

TRACKING - Precise and continuous position-finding of targets by radar, optical, or other means. [1.1]

TRACK TELLING - The process of communicating air surveillance and tactical data information between command and control systems or between facilities within the systems. Telling may be classified into the following types: **BACK TELLING**; **CROSS TELLING**; **FORWARD TELLING**; **OVERLAP TELLING** and **RELATERAL TELLING**. [1.1]

TRADEX - See TARGET RESOLUTION AND DISCRIMINATION EXPERIMENT.

TRAJECTORY BMD COUNTERMEASURES - The launching of missiles, not at maximum range, but at ranges to minimize or maximize trajectories. For example, depressed trajectories would reduce detection ranges by line-of-sight defense radars. Depressed trajectories also could be used to place missiles below minimum altitudes of high-altitude defense systems. [10:2609] See also EVASIVE MANEUVERS BMD COUNTERMEASURES, FALSE-TARGET BMD COUNTERMEASURES, SHROUDING BMD COUNTERMEASURES, SUBMUNITION BMD COUNTERMEASURES.

TRANS-ATLANTIC INDUSTRIAL PROPOSED SOLUTION (TIPS) - A "system of systems" approach centering on the joint development of an active electronically scanned array (AESA) radar integrated on board a midsize jet Alliance Ground Surveillance (AGS) aircraft. [10:2942]

TRANSDUCER - A device by means of which energy can flow from one or more transmission systems or media to one or more other transmission systems or media. [3] NOTE: The energy transmitted may be of any form (e.g., electrical, acoustical, mechanical,...)

TRANSFLECTIVE DISPLAY A LIQUID CRYSTAL DISPLAY which produces back-lighting, hence can be used in low ambient light conditions. [] Contrast with REFLECTIVE DISPLAY.

TRANSFORMATIONAL COMMUNICATIONS (TC) - An INTERNET-like transport ARCHITECTURE between space, air and ground nodes, integrating space, air and ground networks. [] NOTE: TC would provide timely delivery of air and space data to both Theater and CONUS.

TRANSIENT SIGNATURE - That SIGNATURE of a target generated by its various SIGNATURE CONTRIBUTORS. An aircraft, for example, will have a transient signature generated each by (1) airframe heating (varies with Mach number and altitude), (2) engine plume (varies with the gas path temperature), and (3) hot parts (various metal plates and sections of the aircraft). []

TRANSIT NETWORK - A NETWORK which passes traffic between networks in addition to carrying traffic for its own hosts. [10:2736] Contrast with STUB NETWORK. See also BACKBONE, MID-LEVEL NETWORK.

TRANSLINGUAL INFORMATION DETECTION, EXTRACTION AND SUMMARIZATION (TIDES) - A Defense Advanced Research Project Agency (DARPA) Total Information Awareness (TIA) program to develop advanced language processing technology to enable English speakers to find and interpret critical information in multiple languages without requiring knowledge of those languages. [10:2969].

TRANSMITTER LOSSES - See PLUMBING LOSSES.

TRANSPARENT TRANSISTOR - One of a new (2005) class of semiconductors made of an amorphous film of indium gallium zinc oxide (a-IGZO) that can be "sprayed" at room temperature onto a flexible sheets of transparent polyethylene terephthalate, a common plastic. The transistor and its circuitry are essentially transparent and remain stable after repeated bending of the plastic material and even at temperatures as high as 120 degrees Centigrade. [10:3046]

TRANSPONDER - (1) A receiver-transmitter which will generate a reply signal upon proper interrogation. [1.1] (2) A transmitter-receiver facility, the function of which is to transmit signals automatically when the proper interrogation is received. [3] See also RESPONSOR.

TRANSPORTABLE OPTICAL SYSTEM/RELOCATABLE OPTICAL SYSTEM - The Transportable Optical System (TOS) is a transportable 22" (56 cm) optical telescope, Charge Coupled Device (CCD) camera, and associated control system for deep space metric tracking. [10:2804] NOTE: The sensor was originally developed by Lincoln Laboratory as a fieldable prototype in 1989-1990 and deployed to San Vito Air Force Station in Italy. The sensor provides critical metric tracking capacity for deep space catalog maintenance which is deployable to fill gaps in SSN deep space coverage. The TOS requires minimal site preparation and can be operational at a new site three days after arrival. The TOS can be transported in a single C-141 aircraft. TOS can be used as a pre-deployment pathfinder for the GROUND BASED ELECTRO-OPTICAL DEEP SPACE SURVEILLANCE SYSTEM (GEODSS) Upgrade Prototype System (GUPS). [10:2804]

TRANSPORTABLE PORT SECURITY BOAT (TPSB) - A 25-foot Boston whaler outfitted with 175-horsepower outboard engines and carrying a variety of both lethal and NONLETHAL WEAPONS, other equipment, and COMMAND, CONTROL, COMMUNICATIONS AND INTELLIGENCE (C³I) systems. [10:2870]

TRANSPUTER™ - (Trademarked by INMOS group of companies) A microcomputer-on-a-chip incorporating hardware features to support parallel processing. They can be connected like building blocks. []

TRAP DOOR - See BACK DOOR.

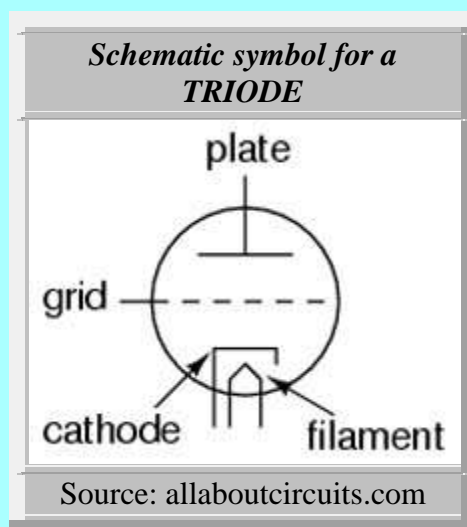
TRAVELING WAVE TUBE (TWT) - An electron tube in which a stream of electrons interacts continuously or repeatedly with a guided electromagnetic wave moving substantially in synchronism with it, and in such a way that there is a net transfer of energy from the stream to the wave. [3]

TREE EQUIPMENT - A non-AN/ nomenclatured series of special EW equipment used by the Fleet Tactical Readiness Group (formerly, Fleet Electronic Warfare Support Group (FEWSG)). []

TRENCH - A photo-defined channel in a dielectric, subsequently plated with copper to form a conductor. [10:2713] See also **MICROVIA**, **RESIN-COATED COPPER (RCC)**.

TRIBOELECTRIFICATION - Generating an electrostatic charge by friction. [3]

TRIODE - A **VACUUM TUBE** containing three elements: **CATHODE**, **GRID**, and plate (**ANODE**). [] See also **DIODE**, **PENTODE**, **TETRODE**. NOTE: The triode was invented by Lee DeForest (*ca* 1906). Calling his invention the "Audion," he vigorously applied it to the development of communications technology. In 1912 he sold the rights to his Audion tube as a telephone signal amplifier to the American Telephone and Telegraph Company (AT and T), which made long-distance telephone communication practical. In the following year he demonstrated the use of an Audion tube for generating radio-frequency AC signals. In 1915 he achieved the remarkable feat of broadcasting voice signals via radio from Arlington, Virginia to Paris, and in 1916 inaugurated the first radio news broadcast. Such accomplishments earned De Forest the title "Father of Radio" in America.[Source: allaboutcircuits.com]



TRIPHIBIAN - A vehicle able to operate on land, water, and air. [] See, for example, **HYBRID ULTRA-LARGE AIRCRAFT (HULA)**.

TRIPLATE - See STRIPLINE DEVICE.

TRIPLE-IMAGE ID - An identification (ID) card containing a color photo image on one side (such as that used on a driver's license or passport), and a laser-engraved image of the same photo on the other side of the card. One photo can be compared visually with the other to confirm that they are identical and no alteration has taken place. If the two facial images do not match, then the card is invalid. A third facial image of the same photo is stored on the card in digital form and can be viewed with the aid of standard computer software. Thus, there are three versions of the same photo. []

TRIPLE PLAY (data) - Data which are in the presence of voice and video. []

TRIPLER - With respect to LASERS, certain non-linear crystals which, in one step, produce an output beam that shorten the wavelength of the input beam three-fold. For example, with the input of a 10.6 micron laser light (FAR INFRARED), the output of a tripler will be a 3.53 micron (MID INFRARED) beam. [10:2559] See also DOUBLER, OPTICAL PARAMETRIC OSCILLATOR.

TRITONAL EXPLOSIVE - A mixture of 80% trinitrotoluene (TNT) and 20% aluminum powder. [] NOTE: The aluminum improves the *brisan*ce of the TNT - the speed at which the explosive develops its maximum pressure, making tritonal explosive about 18 percent more powerful than TNT alone.

TROJAN - See TROJAN HORSE PROGRAM.

TROJAN HORSE PROGRAM - A MALICIOUS SOFTWARE program that simulates a benign application; a Trojan horse program purposefully does something the user does not expect. Trojans differ from VIRUSES in that they do not replicate; however, Trojan horse programs can be just as destructive. [] Also called TROJAN.

TROPHY GRABBING - The act of HACKING where the intent is not to disrupt or damage a system, but to experience the thrill of proving the ability to penetrate a system. [10:2964] NOTE: Trophy grabbing is a badge of achievement in the hacker community. See also GRAY HAT HACKER, HONEYPOT.

TROJAN NETWORK - The overall Trojan network was designed to support intelligence operations, readiness and training. The Trojan program provides a worldwide capability that enables military-intelligence soldiers in the United States to remotely target and exploit global enemy positions in near-real-time. Using this remote capability, soldiers can enhance their language training and improve unit intelligence and electronic warfare readiness. []



TROPOSPHERE - (1) The lower layers of atmosphere, in which the change of temperature with height is relatively large. It is the region where clouds form, convection is active, and mixing is continuous and more or less complete. [1.1] (2) That part of the earth's atmosphere in which temperature generally decreases with altitude, clouds form, and convection is active. [3] NOTE: The earth's troposphere ranges in height from about 6 km at the poles to 18 km at the equator.

TROPOSPHERIC REFRACTIVE EFFECTS PREDICTION SYSTEM (TREPS) - An Australian software system that enables shipborne radars to use DUCTING in the TROPOSPHERE to greatly extend detection ranges. TREPS uses meteorological data to locate atmospheric ducts, and then determines which radar or other sensor system can best take advantage of the phenomenon. [10:2844]

TROPOSPHERIC SCATTER - The propagation of electromagnetic waves by scattering as a result of irregularities or discontinuities in the physical properties of the troposphere. [1.1] See also TROPOSPHERIC SCATTER PROPAGATION.

TROPOSPHERIC SCATTER PROPAGATION - Propagation of radio waves through the atmosphere involving scattering from inhomogeneities in the REFRACTIVE INDEX of the troposphere. [3] See also TROPOSPHERIC SCATTER.

TUNABLE LASER - A LASER which can be varied in frequency. [] NOTE: An example of a tunable laser is the infrared color-center laser, which uses lithium-doped potassium iodide (KI). Developed recently by the Naval Research Laboratory (NRL), it has high stability, high intensity and an extremely broad continuous tunability covering the range from 2 to 4 microns. [10:30]

TURBO ELECTRIC GENERATOR (TEG) - A destroyer escort configured to provide emergency power to a shore installation. [] NOTE: There were seven destroyer escorts converted to this use in the 1940s. The TEG would unreel a power cable using a small craft to

take the connector to the shore installation. Visit the following site for an interesting description of the TEG, as well as photographs: <http://www.de220.com/Conversions/TEG.htm> .

TWIN-MIRROR LASER-RETARGETING SATELLITE - See LASER-RETARGETING SATELLITE.

TWIP Acronym for "twentieth of a point"; a twip is a screen-independent measurement for computer display, used by software program developers. There are 1440 twips in one inch (567 twips per centimeter) [] NOTES: (1) twips are independent of the "dots per inch" feature of a monitor screen. (2) A Windows box could be defined using twips as follows: "Left edge 2820, Top edge 3800; Height 1280; Width 3600."