Digest of Military Electronics

DIGEST
OF
MILITARY ELECTRONICS

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INTRODUCTION

The practice of giving special names and short titles to electronic equipment and systems is widespread in most Government activities and is becoming so in civilian fields. Often, through usage, these names and terms acquire definitive meanings and obtain the status of words in our official and unofficial spoken and written language. An example is RADAR, an acronym which is a contraction of radio detection and ranging. Another example is the word RACON (radar beacon) which contains the first two letters of the first word and the last three letters of the last word. In some cases, a letter is added to make the term more pronounceable. There is an abundance of such nicknames in the literature of military electronics.

This book presents these special names and short titles in alphabetical order for easy reference. Cross references are indicated at the end of each entry and throughout the text by full capitalization of the cross references. Further cross references can be located by turning to broad entries related to the specific entry desired. For instance, after locating LORAN, further cross references can be located by looking up NAVIGATION AIDS, the broad area in which LORAN is located.

For reasons of security, certain areas of military electronics have been discussed superficially or omitted entirely. Numerous unclassified military publications were used as reference sources for this compilation.

A

ABSOLUTE ALTIMETER.

An electronic instrument which measures the distance between the instrument and the terrain below it, as distinguished from an aneroid altimeter, the readings of which depend upon air pressure. See RADAR ALTIMETER.

ABSOLUTE PRESSURE PICKUP.

An instrument which converts a pressure level into a usable quantity. The absolute pressure pickup compares a pressure of unknown intensity to zero pressure and translates the pressure difference into an electrical value (e.g., change of inductance or resistance).

ABSORPTION FREQUENCY METER.

A frequency measuring device, incorporating a variable circuit which absorbs a small portion of the radiated energy under measurement. See WAVEMETER.

ABSORPTION WAVEMETER.

An instrument used for measuring the wavelength and/or the frequency of a given source by means of a calibrated resonant circuit, loosely coupled to the source. Resonance is indicated as a maximum current in the calibrated circuit.

ACC.

See AIR CONTROL CENTER.

ACCELEROMETER.

A device used for determining the acceleration of the system with which it moves. The accelerometer is often used with aircraft to study the stresses aircraft structure undergoes and the duration of those stresses. The seismograph type of accelerometer records displacement versus time. A newer and improved accelerometer, or transducer, indicates acceleration by means of proportional voltages.

ACCURACY, RECEIVER STATION.

Overall accuracy of the station from signal input to the receiver to the output from the discriminator.

ACLS.

See AUTOMATIC CARRIER LANDING SYSTEM.

ACS.

See ARMAMENT CONTROL SYSTEM.

ACTIVE HOMER.

A guidance system in which the guided object contains an energy-radiating device. The target reflects this radiated energy which is detected by the guidance system. See HOMING and GUIDANCE SYSTEMS.

ACW.

See AIRCRAFT CONTROL AND WARNING.

ADDC.

See AIR DEFENSE DIRECTION CENTER.

ADF.

See DIRECTION FINDER.

AEROGRAPH EQUIPMENT.

Equipment carried aloft, as by kite or aircraft, to record automatically and simultaneously various meteorological conditions, such as barometric pressure, temperature, and humidity. The equipment usually includes a temperature-humidity transmitter and a pressure-air speed transmitter. Aerograph equipment can be used to record two types of flight data, horizontal reconnaissance flights and vertical soundings. See RADIOSONDE and WEATHER RADAR.

AIDED TRACKING.

A system of tracking a target signal in bearing, elevation, range, or any combination of these variables.

AI RADAR.

See AIRBORNE INTERCEPT RADAR.

AIR-AID-TO-INTERCEPT RADAR.

An airborne radar set used in interceptor aircraft to locate, track, and intercept hostile aircraft.

AIRBORNE EARLY WARNING RADAR.

See EARLY WARNING RADAR.

AIRBORNE GATE.

An electronic device that maintains information pulse width within prescribed specifications.

AIRBORNE GUN-LAYING RADAR.

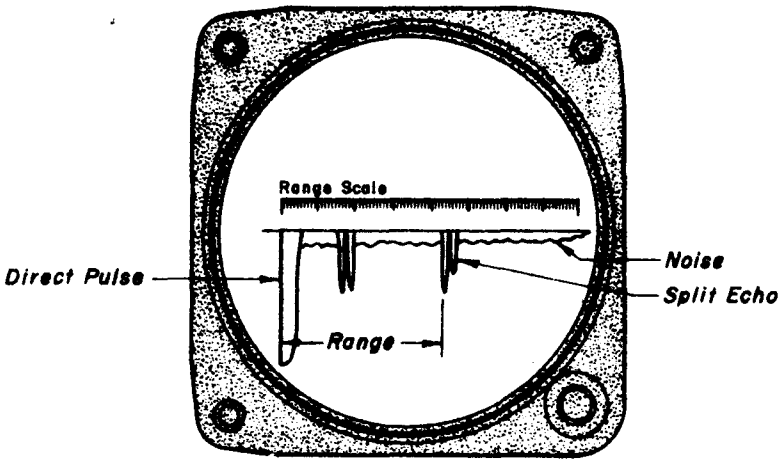
Airborne radar used in interceptor aircraft for plane-to-plane fire control.

AIRBORNE INTERCEPT RADAR: AI RADAR.

Short-range airborne radar employed by fighters and interceptors to locate targets. See RADAR.

AIRCOMNET.

The world-wide USAF Command Communications Network, considered the major USAF communications-electronics system. Aircomnet passes the administrative, logistic, and general operational traffic of the USAF. Under emergency conditions, and within its capabilities, this network accepts traffic concerned with operations normally handled by operational circuits. See COMMUNICATIONS-ELECTRONICS SYSTEMS.



AIRBORNE INTERCEPT RADAR DISPLAY

AIR CONTROL CENTER: ACC.

An Air Force communications facility acting as a 2-way relay agency. ACC is responsible for relaying data from aircraft and radar sites to the combat operations section for decision. ACC also is responsible for transmitting data from the combat operations section to aircraft and radar sites. See AIR DEFENSE CONTROL CENTER and AIR DEFENSE DIRECTION CENTER.

AIRCRAFT CONTROL AND WARNING: ACW.

Aircraft control and warning systems provide information concerning enemy aircraft, alert the primary and other defense systems, and provide for the issuance of air defense warnings. ACW systems use search radar as the basic detection device. Also used are gap-filler radars and height-finder radars as well as automatic identification devices such as IDENTIFICATION FRIEND OR FOE and selective identification feature. See SEARCH RADAR and RADAR.

AIRCRAFT-TO-SURFACE-VESSEL BEACON.

Aircraft-to-surface-vessel equipment was originally designed for spotting submarines and ships. However, it has also been used as a navigation aid in conjunction with beacons situated in the vicinity of air terminals and those marking air routes. See BEACON and NAVIGATION AIDS.

AIRCRAFT-TO-SURFACE-VESSEL RADAR: ASV.

Airborne radar used for the detection of enemy ships and submarines. A rotating antenna is employed which generally sweeps a 360° sector, and the detected target returns are displayed, in proper range and bearing relations, on a plan-position indicator. By the use of radar beacons, located on land, on ships, or in other aircraft, which retransmit characteristic signals when triggered by the ASV equipment, a variety of facilities for navigation and identification are available to aircraft equipped with ASV. See RADAR and RACON.

AIR DEFENSE CONTROL CENTER.

A land-based, air-operations installation that, aided by early-warning facilities, AIR DEFENSE DIRECTION CENTERS, and other facilities, provides aircraft control and warning. It also controls and directs active air defense in a given air defense sector. See AIR CONTROL CENTER.

AIR DEFENSE DIRECTION CENTER: ADDC.

A ground-control intercept station with the responsibilities of air-surveillance, air intercept control, and operational control over combatant forces allocated for the air defense of the subsector. ADDC is a radar installation with extensive communications facilities. Identification responsibilities may also be assigned. See AIR CONTROL CENTER and AIR DEFENSE CONTROL CENTER.

AIR DUCTS.

Metal channels for the distribution of air to ventilate equipment used in telemetering applications.

AI

AIR-GROUND OPERATIONS SYSTEM.

An operations system operated by the ground forces to provide the ground commander with the means for receiving and processing requests of subordinate ground commanders for air missions, and for rapid and continuous exchange of battle information and intelligence. It includes an air-ground operations section, ground liaison officer teams, and the necessary communication facilities.

AIRPORT SURFACE DETECTION EQUIPMENT: ASDE.

Radar equipment used to observe the positions of aircraft and vehicles on the surface of an airport. This radar usually operates on a frequency of 24,000 megacycles. Its short pulse duration and high scan rate provide high resolution and discrimination. Information is displayed on a plan-position indicator which outlines runways and taxiways and shows aircraft and other objects on the runways. See AIRPORT SURVEILLANCE RADAR.

AIRPORT SURVEILLANCE RADAR: ASR.

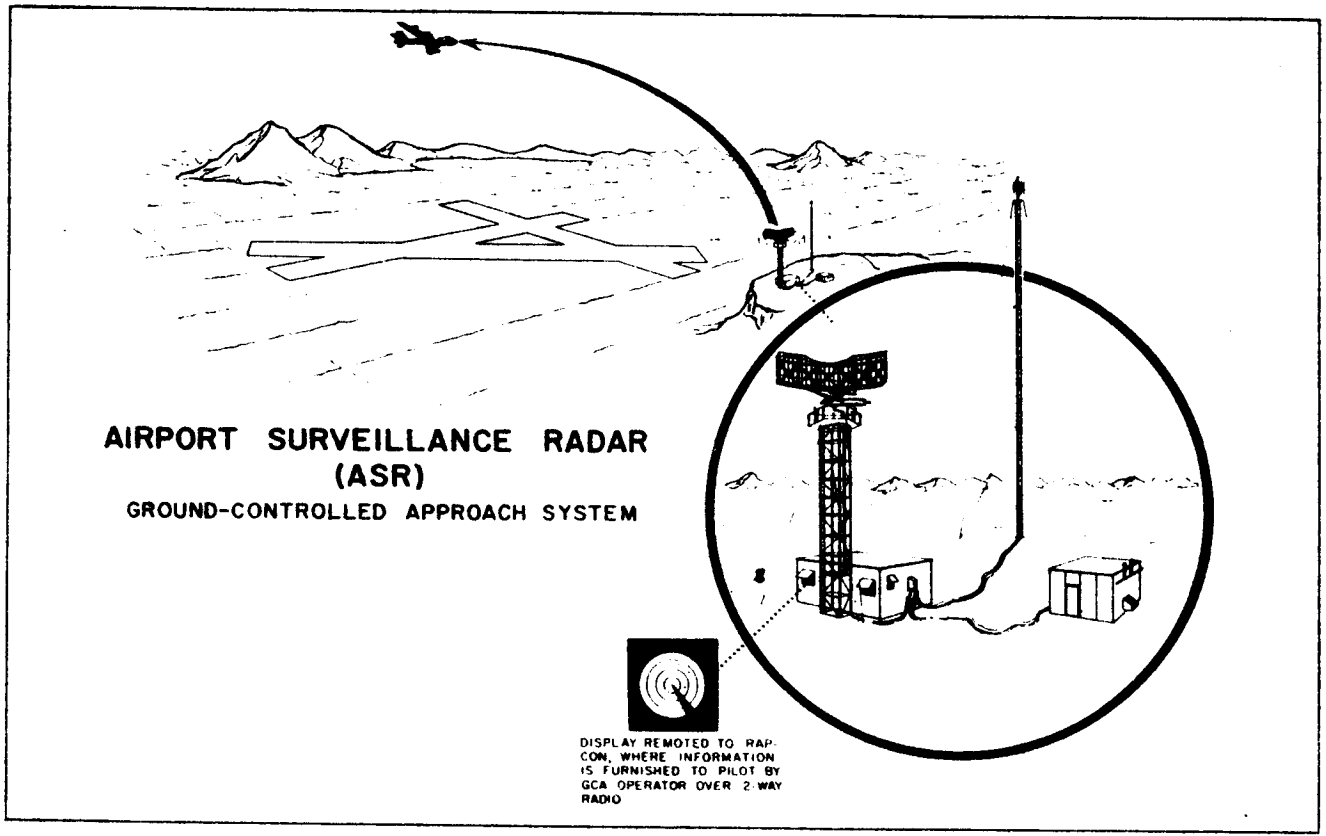
A radar located on or near an airport to provide an indication of the bearing and distance of each aircraft within the terminal area in which the airport is located. It is employed to vector and give navigational guidance to arriving and departing aircraft in the control of air traffic within the terminal area. It does not provide data regarding the elevation of the aircraft. See RADAR and RAPCON.

AIR POSITION INDICATOR: API.

An airborne computing system which presents a continuous indication of aircraft position on the basis of aircraft heading, airspeed, and elapsed time.

AIR-TO-SURFACE MISSILE.

A missile designed for release from aircraft. The missile is guided to a surface target by means of an internal homing device or radio control.


AIRPORT SURVEILLANCE RADAR
(ASR)
GROUND-CONTROLLED APPROACH SYSTEM
DISPLAY REMOTED TO RAP-
CON, WHERE INFORMATION
IS FURNISHED TO PILOT BY
GCA OPERATOR OVER 2-WAY
RADIO

AIR-TO-UNDERWATER MISSILE.

An airborne missile which, when dropped into the water, pursues or seeks out an underwater moving target by means of an internal or radio-guided homing device.

AIR TRAFFIC CONTROL PLOTTING DISPLAY.

Any type of enlarged radar display which is intended for use in the control of air traffic and which is so mounted that the display is horizontal. The radar controller records aircraft positions by placing markers on the horizontal display and sequences traffic by reference to the display. In the event of a failure of the surveillance radar equipment, the markers preserve the pattern of all traffic in the area as it was at the time of the failure and provide initial data for the safe handling of traffic by other means.

AJAX.

A frequency dispersal radar. See RADAR.

ALPHA SURVEY METER.

An instrument used for the detection and measurement of alpha radiation. The device generally employs a proportional counter which utilizes the phenomena of gas ionization to detect and measure radiation absorption. The alpha survey meter contains an extremely thin window to permit the entry of the low-penetrating alpha particles, and a means of discriminating between the pulses produced by alpha particles and the smaller pulses caused by other radiation. The alpha particle, being doubly ionized, produces a greater pulse in the ionization chamber. See PROPORTIONAL COUNTER.

AME.

See ANGLE-MEASURING EQUIPMENT.

ANGEL.

Reflecting material used as a radar countermeasure. The material is dropped from attacking aircraft and is suspended

from balloons or parachutes in order to delay its descent. It confuses enemy radar by providing spurious targets. See COUNTERMEASURES, JAMMING, and RADAR CONFUSION REFLECTORS.

ANGLE-MEASURING EQUIPMENT: AME.

Equipment which is used to measure one or more angles between a reference plane and a target. This equipment is employed in systems which measure:

1. Azimuth angles relative to the heading of an aircraft by use of radar compass, VHF OMNIRANGE, or TACAN. With these equipments, the intersection of two or more angles provides the line-of-direction to an aircraft.

2. Azimuth and elevation angles as measured in a radar system through use of directional antennas with narrow beamwidths. The pointing direction of the antenna determines these two angles. A range measurement, in conjunction with these angles, defines the space position of the target.

3. Cosine of an angle between the baseline and the target (generally a missile or satellite) as defined by an interferometer AME. Two interferometers, with their baselines crossed at their centers, and perpendicular with respect to each other, will measure two direction cosines from which azimuth and elevation angles can be computed. The addition of a range measurement will then fix the spatial position of the target.

ANTIAIRCRAFT FIRE CONTROL RADAR.

Equipment used for precision fire direction and control of antiaircraft artillery.

ANTIJAMMING.

The devices, methods, systems, or equipment used to counter JAMMING.

ANTRAC.

A term used to designate a certain type of radio equipment. It is derived from JAN nomenclature AN/TRC-( ) with an A added for easier pronunciation. It is applied to the AN/TRC-1, -8, and -24 series of radio equipment. See VOLSCAN.

API.

See AIR POSITION INDICATOR.

ARMAMENT CONTROL SYSTEM: ACS.

A system of search and gun-aiming radars used in aircraft to determine the proper course required to intercept a given target. The search radar locates the target at long range. When the target is within 4000 yards, the gun-aiming radar tracks the target. Target data is supplied to a computer and the solution to the firing problem is presented to the pilot on an oscilloscope.

ASDE.

See AIRPORT SURFACE DETECTION EQUIPMENT.

ASPEN.

The airborne component of the OBOE navigation system. It consists essentially of a 10-centimeter airborne radar beacon which is interrogated by two ground radar stations and directed by them. With a different receiver, the set is known as ASPEX. British designations include Album Leaf with Pepper Box Receiver and Fountain Pen and Pen Wiper Receiver.

ASR.

See AIRPORT SURVEILLANCE RADAR.

ASV.

See AIRCRAFT-TO-SURFACE VESSEL RADAR.

AUTOMATIC CARRIER LANDING SYSTEM: ACLS.

A combination radio-radar unit developed for the Navy for use in landing aircraft on carriers under adverse weather conditions. Radar locates the aircraft and determines its altitude and position in relation to the carrier deck. An electronic computer calculates speed and direction, compares the plane's position with what it should be, and determines the necessary course. This information is fed into a radio transmitter which directs the aircraft into the flight pattern. The computer also calculates the speed of the aircraft carrier, its position, and the pitch and roll of the deck at the instant the plane will touch down. If the landing approach is wrong, the device automatically waves off the plane. See CARRIER CONTROLLED APPROACH SYSTEM.

AUTOMATIC DIRECTION FINDER: ADF.

See DIRECTION FINDER.

AUTOMATIC NUMBERING EQUIPMENT (TAPE RELAY).

A type of equipment associated with tape transmitters that automatically transmit a channel number.

AUTOMATIC PILOT.

A control mechanism which initiates corrections in aircraft control surfaces so as to maintain a steady course without manual assistance.

AUTOMATIC PRECISION APPROACH SYSTEM: AGCA.

See GROUND-CONTROLLED APPROACH.

AUTOMATIC RADIO COMPASS.

A radio direction finder which automatically rotates the loop antenna to the correct position, permitting the pilot to secure a radio bearing simply by glancing at the indicator dials. Mechanical adjustments and calculations by the pilot are unnecessary.

AUTOMATIC SEARCH JAMMER.

An intercept receiver and jamming transmitter system which automatically searches for and jams enemy signals of specific radiation characteristics. See JAMMER.

AUTOMATIC TRACKING RADAR.

A radar set which continually and automatically corrects its beam orientation to keep a selected target in the beam. Some tracking radars also supply range tracking information to computers for fire control systems.

AZIMUTH INDICATING METER.

A ground-station receiver used at airports to determine the azimuth angle of arrival of signals from an aircraft. The direction of arrival is shown on the screen of a cathode-ray tube and can be transmitted to a pilot coming in through fog and darkness.

AZIMUTH-STABILIZED PLAN POSITION INDICATOR.

A plan position indicator on which the presentation of signals is so arranged that the top of the screen represents fixed direction and not the plane's tail-nose axis. The fixed direction may be true north or may be established by a gyroscope.

AZON.

A 2-directional, radio-controlled missile. See RAZON.

AZUSA.

A short-baseline, continuous-wave, phase-comparison system operating in the microwave region. Slant range is determined by phase-comparison, distance-measuring equipment, and direction cosines to the target are measured by a pair of radio interferometers whose baselines are mutually perpendicular and intersect at their centers. Coherency is maintained between the ground-station carrier wave and the transponder carrier wave, allowing the Doppler frequency to be measured at the ground station, where it is converted into range rate (radial velocity).

B

BABS.

See BLIND-APPROACH BEACON SYSTEM.

BALLISTIC MISSILE EARLY WARNING SYSTEM: BMEWS

A long-range radar warning system for the detection of intercontinental ballistic missile attacks launched against the U. S. and southern Canada and of intermediate ballistic missiles launched against Great Britain. Through the use of radar and computing devices, BMEWS is able to detect missiles fired from a distant location, determine missile launch points, compute the trajectories of the missiles, and predict the points of impact. This information is transmitted to a command center, where it is evaluated, and appropriate action is initiated.

BARRAGE JAMMERS.

Electronic jammers which spread their energy over a band which is wide in comparison to a radar bandwidth.

BEACON.

A movable or stationary device that sends out light, radio, or radar beacons to guide or orient aircraft. Various types of beacons include:

1. Fan Marker Beacon - A type of radio beacon, the emissions of which radiate in a vertical fan shaped pattern. The signal can be keyed for identification purposes. See MARKER BEACONS.

2. Hazard Beacon - A beacon used to designate an extended or particularly dangerous hazard to air navigation.

3. H Beacon - A nondirectional radio homing beacon which has a power output of 50 to 2000 watts.