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Chapter 1 : Sanyo CHR Manuals

For large acquisitions, the revision of the master in effect on the RFP issue data applies, unless a solicitation amendment incorporates a follow-on revision, in which case the amendment data controls.

Magnetic storage A modern HDD records data by magnetizing a thin film of ferromagnetic material [e] on a disk. Sequential changes in the direction of magnetization represent binary data bits. The data is read from the disk by detecting the transitions in magnetization. User data is encoded using an encoding scheme, such as run-length limited encoding, [f] which determines how the data is represented by the magnetic transitions. A typical HDD design consists of a spindle that holds flat circular disks, also called platters , which hold the recorded data. The platters are made from a non-magnetic material, usually aluminum alloy, glass, or ceramic. They are coated with a shallow layer of magnetic material typically 10â€”20 nm in depth, with an outer layer of carbon for protection. The read-and-write head is used to detect and modify the magnetization of the material passing immediately under it. In modern drives, there is one head for each magnetic platter surface on the spindle, mounted on a common arm. An actuator arm or access arm moves the heads on an arc roughly radially across the platters as they spin, allowing each head to access almost the entire surface of the platter as it spins. The arm is moved using a voice coil actuator or in some older designs a stepper motor. Early hard disk drives wrote data at some constant bits per second, resulting in all tracks having the same amount of data per track but modern drives since the s use zone bit recording â€” increasing the write speed from inner to outer zone and thereby storing more data per track in the outer zones. In modern drives, the small size of the magnetic regions creates the danger that their magnetic state might be lost because of thermal effects , thermally induced magnetic instability which is commonly known as the " superparamagnetic limit ". To counter this, the platters are coated with two parallel magnetic layers, separated by a three-atom layer of the non-magnetic element ruthenium , and the two layers are magnetized in opposite orientation, thus reinforcing each other. That so-called exchange spring media , also known as exchange coupled composite media, allows good writability due to the write-assist nature of the soft layer. However, the thermal stability is determined only by the hardest layer and not influenced by the soft layer. The disk motor has an external rotor attached to the disks; the stator windings are fixed in place. Opposite the actuator at the end of the head support arm is the read-write head; thin printed-circuit cables connect the read-write heads to amplifier electronics mounted at the pivot of the actuator. The head support arm is very light, but also stiff; in modern drives, acceleration at the head reaches g. A metal plate supports a squat neodymium-iron-boron NIB high-flux magnet. Beneath this plate is the moving coil, often referred to as the voice coil by analogy to the coil in loudspeakers , which is attached to the actuator hub, and beneath that is a second NIB magnet, mounted on the bottom plate of the motor some drives have only one magnet. The voice coil itself is shaped rather like an arrowhead, and made of doubly coated copper magnet wire. The inner layer is insulation, and the outer is thermoplastic, which bonds the coil together after it is wound on a form, making it self-supporting. The portions of the coil along the two sides of the arrowhead which point to the actuator bearing center then interact with the magnetic field of the fixed magnet. Current flowing radially outward along one side of the arrowhead and radially inward on the other produces the tangential force. If the magnetic field were uniform, each side would generate opposing forces that would cancel each other out. Therefore, the surface of the magnet is half north pole and half south pole, with the radial dividing line in the middle, causing the two sides of the coil to see opposite magnetic fields and produce forces that add instead of canceling. Currents along the top and bottom of the coil produce radial forces that do not rotate the head. Feedback of the drive electronics is accomplished by means of special segments of the disk dedicated to servo feedback. These are either complete concentric circles in the case of dedicated servo technology , or segments interspersed with real data in the case of embedded servo technology. The servo feedback optimizes the signal to noise ratio of the GMR sensors by adjusting the voice-coil of the actuated arm. The spinning of the disk also uses a servo motor. Modern disk firmware is capable of scheduling reads and writes efficiently on the platter surfaces and remapping sectors of the media which have failed. Error rates and handling[edit] Modern drives make extensive use of error correction codes ECCs , particularly Reedâ€"Solomon error correction. These techniques store extra bits, determined by mathematical formulas, for each block of data; the extra bits allow many errors to be corrected invisibly. The extra bits themselves take up space on the HDD, but allow higher recording densities to be employed without causing uncorrectable errors, resulting in much larger storage capacity. The "No-ID Format", developed by IBM in the mids, contains information about which sectors are bad and where remapped sectors have been located. Examples of specified uncorrected bit read error rates include: Within a given manufacturers model the uncorrected bit error rate is typically the same regardless of capacity of the drive. Several new magnetic storage technologies are being developed to overcome or at least abate this trilemma and thereby maintain the competitiveness of HDDs with respect to products such as flash memory â€"based solid-state drives SSDs. In , Seagate introduced one such technology, shingled magnetic recording SMR. Also the difference in capacity reported in SI decimal prefixed units vs. Calculation[edit] Modern hard disk drives appear to their host controller as a contiguous set of logical blocks, and the gross drive capacity is calculated by multiplying the number of blocks by the block size. In modern HDDs, spare capacity for defect management is not included in the published capacity; however, in many early HDDs a certain number of sectors were reserved as spares, thereby reducing the capacity available to the operating system. For RAID subsystems, data integrity and fault-tolerance requirements also reduce the realized capacity. RAID subsystems are multiple drives that appear to be one drive or more drives to the user, but provide fault tolerance. Most RAID vendors use checksums to improve data integrity at the block level. Some vendors design systems using HDDs with sectors of bytes to contain bytes of user data and eight checksum bytes, or by using separate byte sectors for the checksum data. Disk formatting Data is stored on a hard drive in a series of logical blocks. Each block is delimited by markers identifying its start and end, error detecting and correcting information, and space between blocks to allow for minor timing variations. These blocks often contained bytes of usable data, but other sizes have been used. As drive density increased, an initiative known as Advanced Format extended the block size to bytes of usable data, with a resulting significant reduction in the amount of disk space used for block headers, error checking data, and spacing. The process of initializing these logical blocks on the physical disk platters is called low-level formatting, which is usually performed at the factory and is not normally changed in the field. This includes writing partition and file system structures into selected logical blocks. For example, some of the disk space will be used to hold a directory of disk file names and a list of logical blocks associated with a particular file. As a consequence, not all the space on an HDD is available for user files, but this system overhead is usually small compared with user data.

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Chapter 2 : Messerschmitt Bf variants - Wikipedia

Units of Measurement. - Deliveries shall be indicated and recorded in grams, kilograms, metric tons, pounds, tons, and/or liters, gallons, quarts, pints and decimal subdivisions thereof.

Bf B-2 Bf C-1 "The was a dream, the non plus ultra. Of course, everyone wanted to fly it as soon as possible. Armament was initially planned to be just two cowl-mounted 7. However, possibly due to the introduction of the Hurricane and Spitfire , each with eight 7. The A-0 was not of a uniform type; there were several changes in their appearance. Many of these Bf A-0 served with the Legion Condor and were often misidentified as B-series aircraft, and probably served in Spain with the tactical markings to 6â€" One A-0, marked as 6â€"15, ran out of fuel and was forced to land behind enemy lines. It was captured by Republican troops on 11 November and later transferred to the Soviet Union for a closer inspection. According to RLM documentation 22 aircraft were ordered and delivered with V4 as the A-series prototype. During the production run a variable-pitch propeller was introduced and often retrofitted to older aircraft; these were then unofficially known as B-2s. The Bf B saw combat with the Legion Condor during the Spanish Civil War , although it was apparent that the armament was still inadequate. Several aircraft were produced with an engine-mounted machine gun but it was very unreliable, most likely because of engine vibrations and overheating. Thus the Bf V8 was constructed to test the fitting of two more machine guns in the wings; however, results showed that the wing needed strengthening. Another important change was a strengthened wing, now carrying two more machine guns, giving four 7. The C-0s were pre-production aircraft, the C-1 was the production version, and the C-2 was an experimental version with an engine-mounted machine gun. Despite this, the type saw only limited service during the war, as all of the Bf Ds still in Luftwaffe service at the beginning of the Poland Campaign were rapidly taken out of service and replaced by the Bf E, except in some night fighter units where some examples were used into early Variants included the D-0 and D-1 models, both having a Junkers Jumo D engine and armed with two wing-mounted and two nose-mounted 7. Several Bf Ds were sold to Hungary. Bf E[edit] In late , the Bf E entered production. A much bigger cooling area was needed to disperse the extra heat generated by the DB and this led to the first major redesign of the basic airframe. The new radiator position also had the effect of counterbalancing the extra weight and length of the DB , which drove a heavier three-bladed Vereinigte Deutsche Metallwerke VDM -made propeller. Because the radiators were mounted near the trailing edge of the wing, coinciding with the increased speed of the airflow accelerating around the wing camber , cooling was more effective than that of the Jumo engined s, albeit at the cost of extra ducting and piping, which was vulnerable to damage. The lowered undercarriage could throw up mud and debris on wet airfields, potentially clogging the radiators. While the V14 was armed with two 7. Batches of both E-1 and E-3 variants were shipped to Spain for evaluation, and first saw combat during the final phases of the Spanish Civil War. E-1[edit] Bf E-3 The E-1 production version kept two 7. Later, many were modified to the E-3 armament standard. The E-1B was a small batch of E-1s that became the first operational Bf fighter bomber, or Jagdbomber usually abbreviated to Jabo. The E-1 was also fitted with the Reflexvisier "Revi" gunsight. It was armed with two wing mounted, and one engine mounted Motorkanone MG FF cannon, which gave considerable trouble in service, as well as two synchronized MG 17s cowl machine guns. In August , II. These received some structural improvements and more powerful armament. Both were the basis of the Bf E-3 version. This resulted in a shell with a thin but strong wall, which had a larger cavity in which to pack a much larger explosive charge than was otherwise possible. This canopy, which was also retrofitted to many E-1s and E-3s, was largely unchanged until the introduction of a welded, heavy-framed canopy on the G series in the autumn of The E-4 would be the basis for all further Bf E developments. A total of of all E-4 versions were built, [13] including E-4s built as such: Twenty-nine E-5s were built and nine E-6s were ordered. Alternatively, a bomb could be fitted and the E-7 could be used as a Jabo fighter-bomber. Previous Emil subtypes were progressively retrofitted with the necessary fittings for carrying a drop tank from October

Borrowing ideas from the British and Japanese mainly Akagi , they started the construction of Graf Zeppelin as part of the rebuilding of the navy. This included adding a tail-hook, catapult fittings and increasing the wingspan to The ailerons were increased in span, as were the slats, and flap travel was increased. The wings could, however, be detached from the fuselage for transport purposes, as in every version of the Bf The remaining 63 of 70 T-1s were built as T-2s without carrier equipment and some of the T-1s may have been "upgraded" to T-2 standard. By this time, the Bf T was hopelessly outdated and a new fighter would be needed. Messerschmitt responded with the updated Me A series, but work on the ship was again canceled and the Me was later re-purposed as a high-altitude interceptor. The Bf Ts were issued to several training units in The unit was renamed as The engineers at the Messerschmitt facilities took two Bf E-1 airframes and installed this new powerplant. The first two prototypes, V21 Werknummer Works number or W. Nr and V22 W. Otherwise the wings incorporated the cooling system modifications described below. V22 also became the testbed for the pre-production DB E. Nr , was fitted with new, semi- elliptical wingtips , becoming the standard wing planform for all future Bf combat versions. Nr , flew with the clipped wings but featured a modified, "elbow"-shaped supercharger air-intake, which was eventually adopted for production, and a deeper oil cooler bath beneath the cowling. Aerodynamic improvements[edit] Compared to the earlier Bf E, the Bf F was much improved aerodynamically. The engine cowling was redesigned to be smoother and more rounded. The enlarged propeller spinner, adapted from that of the new Messerschmitt Me , now blended smoothly into the new engine cowling. A new ejector exhaust arrangement was incorporated, and on later aircraft a metal shield was fitted over the left hand banks to deflect exhaust fumes away from the supercharger air-intake. The supercharger air-intake was, from the F-1 -series onwards, a rounded, "elbow"-shaped design that protruded further out into the airstream. Propeller pitch was changed electrically, and was regulated by a constant-speed unit, though a manual override was still provided. Many F-1s and F-2s kept this section glazed. A two-piece, all-metal armour plate head shield was added, as on the E-4, to the hinged portion of the canopy, although some lacked the curved top section. A bullet-resistant windscreen could be fitted as an option. The fuselage aft of the canopy remained essentially unchanged in its externals. The tail section of the aircraft was redesigned as well. The rudder was slightly reduced in area and the symmetrical fin section changed to an airfoil shape, producing a sideways lift force that swung the tail slightly to the left. This helped increase the effectiveness of the rudder, and reduced the need for application of right rudder on takeoff to counteract torque effects from the engine and propeller. The conspicuous bracing struts were removed from the horizontal tailplanes which were relocated to slightly below and forward of their original positions. A semi-retractable tailwheel was fitted and the main undercarriage legs were raked forward by six degrees to improve the ground handling. An unexpected structural flaw of the wing and tail section was revealed when the first F-1s were rushed into service; some aircraft crashed or nearly crashed, with either the wing surface wrinkling or fracturing, or by the tail structure failing. In one such accident, the commander of JG 2 "Richthofen", Wilhelm Balthasar , lost his life when he was attacked by a Spitfire during a test flight. While making an evasive manoeuvre, the wings broke away and Balthasar was killed when his aircraft hit the ground. Slightly thicker wing skins and reinforced spars dealt with the wing problems. Initially, two external stiffening plates were screwed onto the outer fuselage on each side, and later the entire structure was reinforced. Other features of the redesigned wings included new leading edge slats , which were slightly shorter but had a slightly increased chord ; and new rounded, removable wingtips which changed the planview of the wings and increased the span slightly over that of the E-series. Frise-type ailerons replaced the plain ailerons of the previous models. The 2R1 profile was used with a thickness-to-chord ratio of As before, dihedral was 6. A new cooling system was introduced; this system was automatically regulated by a thermostat with interconnected variable position inlet and outlet flaps that would balance the lowest drag possible with the most efficient cooling. A new radiator, shallower but wider than that fitted to the E was developed. A boundary layer duct allowed continual airflow to pass through the airfoil above the radiator ducting and exit from the trailing edge of the upper split flap. The lower split flap was mechanically linked to the central "main" flap, while the upper split flap and forward bath lip position were regulated via a thermostatic valve which automatically positioned the flaps for maximum cooling effectiveness. However, these valves were delivered to frontline units as kits, the number of which, for unknown reasons, was limited. With the early tail unit problems out of the way, pilots generally agreed that the F series was the best-handling of all the Bf series. The DB E ran on standard 87 octane "B-4" aviation fuel, despite its increased performance; while the earlier DB N required octane "C-3" fuel. Production lasted exactly a year between May and May , with 1, of all F-4 variants produced. Modifications included a reinforced wing structure, an internal bullet-proof windscreen, the use of heavier, welded framing for the cockpit transparencies, and additional light-alloy armour for the fuel tank. It was originally intended that the wheel wells would incorporate small doors to cover the outer portion of the wheels when retracted. To incorporate these the outer wheel bays were squared off. Two small inlet scoops for additional cooling of the spark plugs were added on both sides of the forward engine cowlings. A less obvious difference was the omission of the boundary layer bypass outlets, which had been a feature of the F-series, on the upper radiator flaps. Special high-altitude interceptors with GM-1 nitrous oxide injection high-altitude boost and pressurized cockpits were also produced. The DB suffered from reliability problems during the first year of operation, and this output was initially banned by VT-Anw. The full output was not reinstated until 8 June when Daimler-Benz issued a technical directive. Pitch control, as on the F, was either electro-mechanical automatic or manual-electric using a thumb-switch on the throttle lever. The early versions of the Bf G closely resembled the Bf F-4 and carried the same basic armament; however, as the basic airframe was modified to keep pace with different operational requirements, the basically clean design began to change. From the spring of , the G-series saw the appearance of bulges in the cowling when the 7.

Chapter 3 : Hard disk drive - Wikipedia

Describe the characteristics of the voltage, amperage, and resistances when there is more than one load in a parallel circuit. In a parallel circuit, the total voltage is applied across each resistance.

Chapter 4 : Keysight VA Manuals

Effective process control is required to maintain safe operations, quality products, and business viability. Safety The primary purpose of a Process Control system is safety: personnel safety, environmental safety and equipment safety. The safety of plant personnel and the community is the highest priority in any operation.

Chapter 5 : Fundamental characteristics of a circuit-breaker - Electrical Installation Guide

Units Of Measurement Measurement Accuracy Characteristics And Specifications

Chapter 6 : UL - Standard for Industrial Control Equipment | Standards Catalog

Note Science and Reactor Fundamentals Â’ Instrumentation & Control 3 CNSC Technical Training Group Revision 1 Â’ January OBJECTIVES This module covers the following areas pertaining to instrumentation and.