# DOWNLOAD PDF 2. THE RADIO AS AN APPARATUS OF COMMUNICATION 29

## Chapter 1 : Listen to The Red Jumpsuit Apparatus | Pandora Music & Radio

*A radio communication apparatus includes a control unit for conducting modulation scheme changeover control to change a modulation scheme according to a state of a transmission path and automatic transmitter power control to control a transmission level of another radio communication apparatus to set a reception level of a reception signal to be received by the own apparatus to a predetermined.*

A radio communication apparatus according to claim 1,wherein the wire line 3 includes a wire telephone line and the radio terminal unit 2 includes a radio telephone set. A radio communication apparatus according to claim 3, characterised in that the radio terminal unit 2 is controlled to operate an intermittent reception state in which the control channel is intermittently received at a predetermined interval during the period of time when the control channel is established between the base unit 1 and the radio terminal unit 2. A radio communication apparatus according to claim 3 or 4, characterised in that the incoming signal includes an identification signal for identifying the radio terminal unit 2 and a channel designation signal for designating the communication channel. A radio communication apparatus according to claim 3, 4 or 5, characterised in that the off-hook response signal includes an identification signal for identifying the radio terminal unit 2 and a channel designation signal for designating the communication channel. A radio communication apparatus according to any one of claims 1 to 6, characterised in that volume control means 43 are included for controlling a volume of the ring tone generated by the first ring tone generating means  A radio communication apparatus according to claim 7, characterised in that the volume control means 43 controls the volume of the ring tone generated by the first ring tone generating means 23 so as to increase the volume with time. A radio communication apparatus according to claim 8, characterised in that the volume control means 43 controls the volume of the ring tone generated by the first ring tone generating means 23 so as to increase the volume stepwise with time. The present invention relates to radio communication apparatus which include a base unit connected to a wire line and radio terminals connected through a radio circuit and, more particularly, to apparatus which limit the duration of a ring tone generated by a radio terminal to thereby reduce the consumption of a battery of the radio terminal and to greatly prolong the time in which the radio terminal is used in a non-charged state. The signal delivered via the telephone line 3 is supplied as a modulation input to a transmitter 5 via a hybrid circuit 4. The signal modulated by and output from the transmitter 5 is transmitted as waves to the radio telephone set 2 via a transmitting antenna 6. The waves transmitted by the radio telephone set 2 are received by a receiving antenna 7 and demodulated by a receiver 8 of the base unit. The demodulated signal is delivered by the hybrid circuit 4 to the wire telephone line 3. A synthesizer 9 delivers to the transmitter 5 and receiver 8 a signal having a frequency corresponding to a radio channel. One of the outputs from the receiver 8 is input to a received-field intensity detector 10 in order to determine the field intensity. The circuit 10 is generally called a carrier squelch circuit or a noise squelch circuit. Another output from the receiver 8 is delivered as a data signal contained in the demodulated received signal to an identification signal detector 11 which checks an identification signal determined by the combination of the base unit 1 and radio telephone set 2. The identification signal is generally called an ID code signal. The output from the detector 11 and the modulated data signal are input to a control circuit 12 for use in the connection control. The control circuit 12 controls the synthesizer 9 to provide switching control between radio channels or to cause a transmission data signal to be input as a modulation input to the transmitter 5. The radio telephone set 2 also includes a receiving antenna 13, a receiver 14 and a transmitting antenna  The demodulated output from the receiver 14 is delivered to a telephone receiver  The voice input to a telephone transmitter 16 becomes a modulation input to the transmitter 17 and the resulting modulated signal is transmitted via the transmitting antenna  A synthesizer 19, a received-field intensity detector 20, and an identification signal detector 21 are similar to the corresponding ones of the base unit 1. A control circuit 22 provides the entire control of the radio telephone set 2. A speaker 23 is a sounder which generates a ring tone when there is an incoming call. A power source for these elements in the base unit includes an AC plug 24 connected to an AC V source and a rectification stabilizing circuit 25, the outputs of which are provided to the respective required elements. The output from the stabilizing circuit 25 is supplied to a chargeable battery 29 for the radio telephone set 2 via a current restricting resistor 26 via a pair of charging terminals 27 and  The output from the battery 29 is used as a power source for the radio telephone set 2. Reference numeral 31 denotes a power source switch for the telephone set 2; 32, a dial key unit used for transmitting a call; and 33, a line relay forming a direct current loop. The control of this conventional apparatus performed when there is an incoming call is outlined as follows. When an incoming signal detector 30 of the base unit 1 detects an incoming signal from the wire telephone line 3 when the base unit is in a standby state, it sets the oscillating frequency of the synthesizer 9 to a control channel frequency, and turns on the transmitter 5 to cause same to transmit the incoming signal which contains a signal designating a talking channel S-CH. The radio telephone set 2 turns on the synthesizer 19 for a predetermined interval of time t1 in its standby state, sets the oscillating frequency of the synthesizer at the control channel frequency and turns on the receiver  When the incoming signal is received, the telephone set 2 turns on the transmitter 17 to cause same to deliver an answer signal and selects the designated talking channel S-CH. Unless an incoming signal is received, the synthesizer 19 and receiver 14 are turned off for a predetermined interval of time t2. When the base unit 1 detects the waves from the radio telephone set 2 using the received-field intensity detector 10, it stops transmission of the incoming signal. Unless waves from the radio telephone set 2 are detected, the base unit continues to transmit the incoming signal up to a predetermined number of times n. The reason why the transmission is performed so is that the radio telephone set 2 is in an intermittent reception state in which the telephone set cannot receive signals for the interval of time t2. The reason why the transmission is stopped after it is performed up to n times is to avoid useless occupation of the control channel when the power source for the telephone set 2 is off or the telephone set 2 is at a great distance from the base unit. If the ID code signal contained in the answer signal from the telephone set 2 coincides with a preset code, the base unit 1 selects the talking channel S-CH designated by the incoming signal. If not, the base unit 1 waits for the disappearance of the call from the wire telephone line 3 and then returns to the standby state thereof because there may be a response from a radio telephone set on another set. After the base unit 1 selects the channel S-CH, it delivers a bell ring signal. When the telephone set 2 receives this signal, it generates a ring tone from a speaker  If the telephone set 2 responds to the ring tone by going off-hook, it sends an off-hook signal to the base unit to thereby enable communication. When the base unit 1 receives the off-hook signal, it stops transmission of the bell ring signal and closes the line relay 33 to establish a talking loop via the wire telephone line 3 to thereby enable telephone communication. When the telephone set 2 transmits a call signal, the telephone set 2 and base unit 1 operates as follows. When the telephone set 2 performs a calling operation on the wire telephone line 3, the control circuit 22 determines that it should shift to the transmitting operation, locks the oscillating frequency of the synthesizer 19 to the control channel frequency, and turns on the receiver 14 to thereby cause same to receive waves at the control channel C-CH. The control circuit 22 detects the field intensity of the received waves at the control channel C-CH using the output detection signal from the received-field intensity detector  Unless the received-field intensity is higher than a predetermined value, the control circuit 22 determines that the control channel is idle and turns on the transmitter 17 to thereby cause same to transmit the ID code signal allocated to the telephone set 2. When the base unit 1 receives the ID code signal, it checks whether the ID code signal coincides with the ID code allocated to the combination of the base unit 1 and telephone set 2. If so, the base unit 1 turns on the transmitter 5 to cause same to transmit to the telephone set 2 an answer signal comprising the ID code and data designating S-CH. When the telephone set 2 receives the answer signal from the base unit 1 through the control channel, it checks whether the ID code signal contained in the answer signal coincides with the ID code allocated to the telephone set 2. If so, the telephone set 2 changes the oscillating frequency of the synthesizer 19 to the frequency of the talking channel designated by the base unit 1. After the base unit 1 has transmitted the answer signal, it also changes the oscillating frequency of the synthesizer 9 to the frequency of the talking channel designated for telephone communication. Thus the base unit 1 and telephone set 2 are connected through the talk channel designated by the base unit 1. Thereafter, by an dialing operation using dial key unit 32, the telephone set connected through the wire telephone line 3 is called to enable telephone communication. As will be understood from the above description, when there is an incoming signal on the wire telephone line 3, the base unit 1 causes the speaker 23 to generate a ring tone until the telephone set 2 responds by the off-hook operation. Therefore, when there is no user at the telephone set 2 or in a range in which the ring tone reaches the user, the speaker 23 continues to generate the ring tone so long as the caller at the wire telephone line 3 gives up his intention. As a result, the consumption of the battery 29 would be speeded up and the telephone set 2 would stop its function. It is an object of the present invention to provide a radio communication apparatus which reduces the consumption of the battery for a radio telephone set. Wolf Anch ohne Schnur auf Draht describes a cordless telephone apparatus having a base unit and radio terminal unit which is mounted on the base unit for charging a battery in the radio. When the base unit detects an incoming signal, a ring rone is generated in both the base unit and the radio terminal unit. Thus, a ring tone is generated from the speaker in the base unit only when the radio terminal unit is connected to the base unit for charging purposes. Therefore, the time during which the ringing tone is generated when the radio telephone set is in the non-charging state is restricted to within a predetermined time, so that the consumption of the battery energy is reduced. The radio telephone set 2 includes a volume control circuit 43 which controls the volume of the ring tone. Except at this structure, the radio communication apparatus of Fig. In operation, the control on the transmission and reception of calls in a non-charging state in which the radio telephone set 2 is not connected to the base unit 1 for charging purposes is basically the same as that in the conventional apparatus except that when the base unit 1 does not receive an off-hook signal which should be generated by the off-hook response of the radio telephone set a predetermined time after the base unit 1 has transmitted a bell ring signal toward the radio telephone set 2 in the non-charged state, the control circuit 12 instead causes the speaker 41 of the base unit 1 to generate the ring tone. When the radio telephone set 2 receives the incoming signal, the control circuit 43 causes the speaker 23 to gradually increase with time the volume of the ring tone generated from the speaker, for example, to 70, 80, 90dB Therefore, even if the user of the radio telephone set 2 is at a slight distance from the telephone set 2, he can surely know that there is an incoming call, and an unresponded state and hence the consumption of the battery 29 are prevented from continuing long due to a small ringing tone. If there is no off-hook response after a lapse of a predetermined time, the control circuit 12 of the base unit 1 transmits a signal which stops the bell ring, then interrupts the radio circuit between the telephone set 2 and the base unit 1, and causes the speaker 41 of the base unit 1 to generate a ring tone. Therefore, the duration of the ring tone generated by the radio telephone set 2 is restricted to within a predetermined time. As a result, useless consumption of the battery 29 energy is prevented. In a charged state in which the radio telephone set 2 is connected to the base unit 1 in order to charge the battery 29, a charging detector 42 detects that the battery 29 is in the charged state, and delivers to the control circuit 12 a signal indicating that the battery is being charged. The control circuit 12 detects with that signal that the telephone set 2 is in the charged state. If there is an incoming call from the wire telephone line 3 under such conditions, the control circuit 12 causes the speaker 41 to generate a ring tone without connecting the radio telephone set 2 and the wire telephone line 3 by radio. The user of the telephone set 2 performs an off-hook operation in response to that ring tone from the speaker By this operation, a radio circuit is established between the base unit 1 and telephone set 2 to thereby enable telephone communication. If there is an incoming signal on the wire telephone line 3, this signal is detected by the incoming signal detector Thus, the control circuit 12 determines that there is an incoming signal step Subsequently, the control circuit 12 determines whether the telephone set 2 is in the charged state in accordance with the output from the charging detector 42 step If the telephone set 2 is disconnected from the base unit 1 and is in the non-charged state, the base unit 1 sets the oscillating frequency of the synthesizer 9 to the control channel frequency step , turns on the transmitter 5 step , clears a count N step and transmits the incoming signal to the telephone set 2 via the antenna 6 step The incoming signal contains a channel designating signal designating an idle talking channel. Under such conditions, the telephone set 2 turns on the receiver 14 for a predetermined interval of time t1, then turns off the receiver 14 for a predetermined interval of time t2, and repeats these operations to perform an intermittent reception. In more detail, as shown in Fig. After the interval of time t1 has passed step , the control circuit 22 turns off the receiver 14 step , and again starts the timer step When the control circuit detects a lapse of an interval of time t2 step , it again sets the frequency of the synthesizer at the control channel frequency step , and then turns on the receiver 14 step The control circuit then repeats these operations. When the receiver 14 receives an incoming signal from the base unit 1 at step , the control circuit 22 delivers an answer signal by driving the transmitter 17 step , and switches the channel from the radio channel of the receiver 14 and transmitter 17 to their talking channel step The answer signal transmitted at step contains an ID code to identify the radio telephone set 2. The switching to the talking channel at step is performed in accordance with the channel designating signal contained in the incoming signal. When the base unit 1 receives the answer signal from the telephone set 2 step , it determines whether the ID code contained in the answer signal coincides with a preset ID code step If so, base unit switches the channel from the radio channels of the transmitter 5 and receiver 8 of the base unit 1 to their talking channels corresponding to the channel designating signal contained in the incoming signal step It is determined at step that there is no received answer signal, the base unit 1 increments the count N by one step , checks whether the count N has reached a predetermined count n, for example, of 10 step If N is smaller than n, control again returns to step where the base unit transmits the incoming signal. The transmission of the incoming signal is repeated n times. The reason why it is arranged that the transmission of the incoming signal is repeated n times is that the radio telephone set performs an intermittent reception at predetermined periods, as mentioned above. If the count N reaches n at step , the base unit returns to its standby state. When the control circuit 12 of the base unit 1 selects the talking channel, it transmits a bell ring signal step , and starts a timer not shown step When the control circuit 22 of the telephone set 2 receives that bell ring signal step , it drives the speaker 23 via a volume control circuit 43 to thereby cause the speaker 23 to generate a ring tone. This ring tone is controlled such that it increases gradually in volume with time.

## Chapter 2 : Importance of Radio Communication | calendrierdelascience.com

*A radio communication apparatus, comprising: a communication control part configured to control at least one of direct communication or relay communication with one or more target radio communication apparatuses, the relay communication occurring through a base station; a data generation part configured to generate at least one of a mode.*

Then, the MCU 56 sets the status registration mode by an interrupt and executes the control program associated with this mode in step S2. For the operation of the system, the MCU 56 controls various functional modules in the transmitting circuit 52 and the receiving circuit 54, the local oscillation frequencies from the frequency synthesizer 55, and the connection statuses of the input switching circuit 51 and the antenna switching circuit 53, according to operation command inputs from the switches and knobs 11 to 27 on the operator section 59 and the switches 28 to 33 in the microphone 2. The MCU 56 thereby makes various functional settings corresponding to transmitting and receiving conditions that have been commanded and selected. If the status registration mode described above is set, the MCU 56 detects functional setting data at that point, and writes it in the data table in the RAM 58 in step S3. Namely, as shown in FIG. In this status registration mode, the MCU 56 writes functional setting data in the data cell Dset in the data table. The functional items in the table are associated with the transmitting and receiving conditions that are modified and set according to the types of the operation of the radio transmitter-receiver. If the functional setting data is already written in the data cell Dset, it is updated by overwriting. Then, if the data writing is completed in step S4, the MCU 56 cancels the status registration mode. Then, the system returns to its original state in step S5. In other words, this status registration mode is set for the occasion of the change of operator, and is used to record the transmitting and receiving conditions at the point of operator change in the data table. After the operator change, an operator who performs communication thereafter may modify the transmitting and receiving conditions or set new transmitting and receiving conditions by means of the operator section 59 and the switches 28 to 33 in the microphone 2. Thus, when the initial operator has returned for the change to resume communication, functional settings associated with the original transmitting and receiving conditions would not always remain the same. In this case, it should be arranged that the status registration mode is set by the initial operator alone for the occasion when the change to the initial operator is made. An operation procedure in this status confirmation mode is shown in a flowchart in FIG. According to the mode setting operation, the MCU 56 interrupts the procedure of the system to execute the control program in the status confirmation mode in steps S11 and S For execution of the control program, the MCU 56 first detects all functional setting data at that point, as in the status registration mode, and then writes them in the Dref refer to FIG. If the data is already written in the Dref of the data table, it is updated by overwriting. Thus, the functional setting data for the occasion of the future change to the initial operator is stored in the Dset of the data table, while the functional setting data at the current point of the operator is stored in the Dref, both corresponding to respective functional items. Then, upon completion of data writing into the Dref of the data table in step S14, the MCU 56 makes comparisons between the functional setting data in the Dset and the functional setting data in the Dref, for respective functional items, to determine whether all pairs of functional setting data in the Dset and the Dref coincide in steps S15 and S If all pairs of the functional setting data in the Dset and the Dref are determined to coincide, the status confirmation mode is terminated in steps S16 and S Accordingly, if the indicator lamp 21 does not flash, the initial operator can confirm that the operator who has performed communication thereafter did not modify the original functional settings. For this reason, he can confirm that communication can be resumed with the original functional settings remain unmodified. On the other hand, if the indicator lamp 21 flashes, it means that one or more of the functional settings has been modified. However, it cannot be known what functional setting associated with which functional item has been modified. Thus, in this embodiment, the MCU 56 reads out a functional item and functional setting data associated with the functional item in the Dset and the Dref that do not coincide, from the data table in the

RAM To take an example, if functional setting data in the Dset in the status registration mode and functional setting data in the Dref in the status confirmation mode are as shown in FIG. Since the liquid crystal display section 40 does not have so large a display area, the UP and DOWN switches 19 are employed for scrolling so as to allow confirmation of all functional item data that has been modified. Next, the operator, who has confirmed from the liquid crystal display section 40 that modification of functional settings has been made, turns on the HOME switch 26 in step S19, if it is necessary to restore the current functional settings to their original states. Then, according to the displayed functional setting data in the Dset associated with the functional items, the MCU 56 controls the functional modules of the transmitting circuit 52 and the receiving circuit 54 associated with the functional items. Then, the MCU 56 thereby automatically restores the current functional settings to their original states in step S If communication is then resumed in the restored original states, the operator should turn on the FUNC switch 18 and the HOME switch 26 simultaneously in step 21, as in the case where the state confirmation mode has been set. If communication is to be carried on in the state where modification of the functional settings was performed, the operator should turn on the FUNC switch 18 without turning on the HOME switch In response to the operation command signal, the MCU 56 turns off the indicator lamp 21 and then cancels the status confirmation mode in steps S22 and S Thus, according to the status confirmation mode, when the operator resumes communication, it can be checked from the state of the indicator lamp 21 whether the current functional settings are modified from the functional settings previously stored in the status registration mode. Further, if modification has been performed, it can be confirmed which functional item is modified. Then, restoration to the original functional settings can be performed by a simple operation, if necessary. Incidentally, the status registration mode in FIG. The status registration mode is not effective in the case the immediately preceding functional settings are to be restored after an unintended erroneous operation has been performed. In other words, even if the operator who has changed performs modification of functional settings associated with transmitting and receiving conditions at will, restoration to the state at the point of the operator change alone can be performed. Restoration of functional settings to their preceding state immediately before the occurrence of an unintended erroneous operation is not guaranteed. In order to address this problem, use of a periodically automatic registration process in combination with the state confirmation mode as shown in a flowchart in FIG. First, when the radio transmitter-receiver system is powered up, the MCU 56 activates a built-in timer 56 a in step S If a predetermined time such as five seconds has elapsed with no operation command signal detected in step S34, the MCU 56 writes functional setting data at that point into the Dset in the data table of the RAM 58 in step S35, as in the case of the status registration mode. In this case, except in the initial state, data is already written. Thus, in order to update the data, overwriting is performed. Accordingly, if the before-mentioned status confirmation mode in FIG. Thus, communication can be continued smoothly without interruption. Incidentally, when the periodically automatic registration process is selectively set in combination with the status registration mode described above, combinations of various switches which are not used by the system, may be allocated to issue a command for the selection. Then, either one of the periodically automatic registration process and the status registration mode should be executed, as required. In the above embodiment, the description was directed to the radio transmitter-receiver. The present invention, however, can be applied to transmitters and receivers separately as well. Further, in this embodiment, if modification of any of functional settings has been identified in the status confirmation mode, notification is made by flashing of the indicator lamp Notification by a beep sound or display of a message on the liquid crystal display section 40, for example, may also employed. Still further, in this embodiment, the status registration mode and the status confirmation mode are set by the use of combinations of the switches. A dedicated switch, however, may be provided and may also be employed for making a setting operation. Those skilled in the art will recognize further variations are possible within the scope claimed below. A multi-function radio communication apparatus comprising: The multi-function radio communication apparatus as set forth in claim 1 wherein: The multi-function radio communication apparatus as set forth in claim 2 wherein: The multi-function radio communication apparatus as set forth in claim 3 wherein: The multi-function radio communication apparatus as set forth in claim 1 said actuator is selected from the group consisting of knobs and switches. The multi-function radio communication apparatus as set forth in claim 4 said microprocessor includes a read only memory storing said first and second control programs. The multi-function radio communication apparatus as set forth in claim 1 said data storage area includes a data table located in a random access memory. The multi-function radio communication apparatus as set forth in claim 8 wherein: The multi-function radio apparatus as set forth in claim 1 said first mode is initiated by selective manipulation of at least two actuators. The multi-function radio apparatus as set forth in claim 13 wherein: The multi-function radio communication apparatus as set forth in claim 1 said indicator element is an illumination device and said modification notification is a repeated flashing. The multi-function radio communication apparatus as set forth in claim 6 wherein: The multi-function radio communication apparatus as set forth in claim 16 wherein:

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## Chapter 3 : Cobham plc, Radio Communication-at-Sea, SOLAS Chapter II-2 Regulation Whitepaper

*9 Responses to "Bertolt Brecht, "The Radio as an Apparatus of Communication," " Firstly, perhaps in the future it might be good to narrow down the questions to at least the same discourse, since if everybody posts 5 questions for each text it might tally up to quite a bit of responding.*

This article may need to be cleaned up. It has been merged from Radio History. Invention of radio The idea of wireless communication predates the discovery of "radio" with experiments in " wireless telegraphy " via inductive and capacitive induction and transmission through the ground, water, and even train tracks from the s on. James Clerk Maxwell showed in theoretical and mathematical form in that electromagnetic waves could propagate through free space. After the discovery of these "Hertzian waves" it would take almost 20 years for the term "radio" to be universally adopted for this type of electromagnetic radiation [4] many scientists and inventors experimented with wireless transmission, some trying to develop a system of communication, some intentionally using these new Hertzian waves, some not. Over several years starting in the Italian inventor Guglielmo Marconi built the first complete, commercially successful wireless telegraphy system based on airborne Hertzian waves radio transmission. In an presentation, published in , James Clerk Maxwell proposed his theories and mathematical proofs on electromagnetism that showed that light and other phenomena were all types of electromagnetic waves propagating through free space. Thus "wireless telegraphy" and radio wave-based systems can be attributed to multiple "inventors". Development from a laboratory demonstration to a commercial entity spanned several decades and required the efforts of many practitioners. In , David E. Hughes noticed that sparks could be heard in a telephone receiver when experimenting with his carbon microphone. He developed this carbon-based detector further and eventually could detect signals over a few hundred yards. He demonstrated his discovery to the Royal Society in , but was told it was merely induction, and therefore abandoned further research. Thomas Edison came across the electromagnetic phenomenon while experimenting with a telegraph at Menlo Park. He noted an unexplained transmission effect while experimenting with a telegraph. He referred to this as etheric force in an announcement on November 28, Edison would go on the next year to take out U. Patent , on a system of electrical wireless communication between ships based on electrostatic coupling using the water and elevated terminals. Although this was not a radio system the Marconi Company would purchase the rights in to protect them[ clarification needed ] legally from lawsuits. Louis, Missouri and at the Franklin Institute in Philadelphia , Tesla proposed this wireless power technology could also incorporate a system for the telecommunication of information. In a lecture on the work of Hertz, shortly after his death, Professors Oliver Lodge and Alexander Muirhead demonstrated wireless signaling using Hertzian radio waves in the lecture theater of the Oxford University Museum of Natural History on August 14, During the demonstration radio waves were sent from the neighboring Clarendon Laboratory building, and received by apparatus in the lecture theater. Bose wrote in a Bengali essay, "Adrisya Alok" "Invisible Light" , "The invisible light can easily pass through brick walls, buildings etc. Therefore, messages can be transmitted by means of it without the mediation of wires. Following that, Bose produced a series of articles in English, one after another. An earlier description of the device was given by Dmitry Aleksandrovich Lachinov in July in the second edition of his course "Fundamentals of Meteorology and Climatology", which was the first such course in Russia. In the young Italian inventor Guglielmo Marconi began working on the idea of building a commercial wireless telegraphy system based on the use of Hertzian waves radio waves , a line of inquiry that he noted other inventors did not seem to be pursuing. Marconi raised the height of his antenna and hit upon the idea of grounding his transmitter and receiver. With these improvements the system was capable of transmitting signals up to 2 miles 3. Marconi opened his "wireless" factory in the former silk -works at Hall Street, Chelmsford , England in , employing around 60 people. Shortly after the s, Marconi held the patent rights for radio. Marconi would go on to win the Nobel Prize in Physics in [35] and be more successful than any other inventor in his ability to commercialize radio and its associated equipment into a global business. According to the newspaper Jornal do Comercio June 10, , he conducted his first public experiment on June 3, , in front of journalists and the General Consul of Great Britain, C. The points of transmission and reception were Alto de Santana and Paulista Avenue. It was described as "equipment for the purpose of phonetic transmissions through space, land and water elements at a distance with or without the use of wires. Having few resources, he had to rely on friends to push his project. Despite great difficulty, three patents were awarded: On Christmas Eve , Reginald Fessenden used a synchronous rotary-spark transmitter for the first radio program broadcast, from Ocean Bluff-Brant Rock , Massachusetts. Ships at sea heard a broadcast that included Fessenden playing O Holy Night on the violin and reading a passage from the Bible. The first college radio station began broadcasting on October 14, from Union College, Schenectady, New York under the personal call letters of Wendell King, an African-American student at the school. In November , it aired the first broadcast of a sporting event. Only about twenty homes in the city had receivers to tune in this radio program. Meanwhile, regular entertainment broadcasts commenced in from the Marconi Research Centre at Writtle , England. Sports broadcasting began at this time as well, including the college football on radio broadcast of a West Virginia vs. This continued until the early s when VOR systems became widespread. By the end of the decade, they were established commercial modes. Radio was used to transmit pictures visible as television as early as the s. Commercial television transmissions started in North America and Europe in the s. From its start in St. Mobile Telephone Service was a rarity with only 5, customers placing about 30, calls each week. Because only three radio channels were available, only three customers in any given city could make mobile telephone calls at one time. It was the primary analog mobile phone system in North America and other locales through the s and into the s. In , the Regency company introduced a pocket transistor radio , the TR-1 , powered by a "standard  It was durable, because it had no vacuum tubes to burn out. Over the next 20 years, transistors replaced tubes almost completely except for high-power transmitters. By , color television was being broadcast commercially though not all broadcasts or programs were in color , and the first radio communication satellite , Telstar , was launched. In the late s, the U. Navy experimented with satellite navigation , culminating in the launch of the Global Positioning System GPS constellation in  In the early s, amateur radio experimenters began to use personal computers with audio cards to process radio signals. In , the U. Army and DARPA launched an aggressive, successful project to construct a software-defined radio that can be programmed to be virtually any radio by changing its software program. Digital transmissions began to be applied to broadcasting in the late s. Start of the 20th century Around the start of the 20th century, the Slaby-Arco wireless system was developed by Adolf Slaby and Georg von Arco. In , Reginald Fessenden made a weak transmission of voice over the airwaves. In , Marconi conducted the first successful transatlantic experimental radio communications. In , The U. This also allowed the U. In , Marconi established the first commercial transatlantic radio communications service, between Clifden , Ireland and Glace Bay , Newfoundland. He began collaborating with Marconi on resolving the problem of a wireless communication system, obtaining some patents by the end of  Cervera, who had worked with Marconi and his assistant George Kemp in , resolved the difficulties of wireless telegraph and obtained his first patents prior to the end of that year. This is after Marconi established the radiotelegraphic service between the Isle of Wight and Bournemouth in  In , Domenico Mazzotto wrote: This company, along with its subsidiaries Canadian Marconi and American Marconi , had a stranglehold on ship-to-shore communication. It operated much the way American Telephone and Telegraph operated until , owning all of its equipment and refusing to communicate with non-Marconi equipped ships. Many inventions improved the quality of radio, and amateurs experimented with uses of radio, thus planting the first seeds of broadcasting. Nikola Tesla assisted in the construction. A similar station was erected in Nauen , creating the only wireless communication between North America and Europe. Reginald Fessenden The invention of amplitude-modulated AM radio, so that more than one station can send signals as opposed to spark-gap radio, where one transmitter covers the entire bandwidth of the spectrum is attributed to Reginald Fessenden and Lee de Forest. On Christmas Eve , Reginald Fessenden used an Alexanderson alternator and rotary spark-gap transmitter to make the first radio audio broadcast, from Brant Rock, Massachusetts. It used spark gap technology, but modulated the carrier frequency with the human voice, and later music. Herrold, the son of a Santa Clara Valley farmer, coined the terms "narrowcasting" and "broadcasting", respectively to identify transmissions destined for a single receiver such as that on board a ship, and those transmissions destined for a general audience. The term "broadcasting" had been used in farming to define the tossing of seed in all directions. Charles Herrold did not claim to be the first to transmit the human voice, but he claimed to be the first to conduct "broadcasting". To help the radio signal to spread in all directions, he designed some omnidirectional antennas , which he mounted on the rooftops of various buildings in San Jose. Herrold also claims to be the first broadcaster to accept advertising he exchanged publicity for a local record store for records to play on his station , though this dubious honour usually is foisted on WEAF  RMS Titanic April 2,  After this, wireless telegraphy using spark-gap transmitters quickly became universal on large ships. In , the International Convention for the Safety of Life at Sea was convened and produced a treaty requiring shipboard radio stations to be manned 24 hours a day. As the gaps made and broke contact, the radio wave was audible as a tone in a magnetic detector at a remote location. The telegraph key often directly made and broke the 2, volt supply. One side of the spark gap was directly connected to the antenna. Receivers with thermionic valves became commonplace before spark-gap transmitters were replaced by continuous wave transmitters. The company later became the first to broadcast on a daily schedule, and the first to broadcast radio dance programs, university professor lectures, the weather, and bedtime stories. Regeneration , the superheterodyne circuit and wide-band frequency modulation or FM. Regeneration or the use of positive feedback greatly increased the amplitude of received radio signals to the point where they could be heard without headphones. The superhet simplified radio receivers by doing away with the need for several tuning controls. It made radios more sensitive and selective as well. FM gave listeners a static-free experience with better sound quality and fidelity than AM. This is the origin of the terms long wave , medium wave , and short wave radio.

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## Chapter 4 : Union County (NJ) - The RadioReference Wiki

*A radio communication apparatus including an operator control section with at least one actuator for appointing a function setting that may be recorded in a first data structure and thereafter detected and recorded in a second data structure wherein a microprocessor may compare the two settings and issue a modification notification indicating that the initial setting has been changed.*

Downtown Parking Enforcement Segway  Radio Patrol Car  M35A3 AM General 6x6 2. The facility is the former Central Railroad of New Jersey steam locomotive roundhouse. During those periods they are first due throughout the entire township. Two Cranford Police radio cars are also dispatched for every medical call as first responders. Two Cranford Police radio cars are also dispatched to all medical calls as first responders. Some investigative and tactical talkgroups use encryption. EPD does not use car numbers as radio identifiers. At any given time, on any given day, a unit may cover multiple sectors. All cars are two-man cars unless denoted by Sierra suffix or Safenet Urban Enterprise Zone assignment. Alpha units are day shift,  For example 7-Alpha would be a day shift patrol unit assigned to sector 7, and so on. Baker units are night shift,  For example 4-Baker would be a night shift unit assigned to sector 3, and so on. These are also known as the midnight cars. Sierra units are single man cars regardless of shift. For example 2-Sierra would be a single man car assigned to sector 2. Power units are so named because they are assigned to the highest crime sectors and work the highest crime hours,  For example Power 11 would be a high-crime area vehicle assigned to sector  These are the busiest units at night. Safenet or Net units are so names because they are community policing oriented units, assigned to Urban Enterprise Zones and retail shopping areas. Chief is Unit 1. For example Unit 24, 34, 44, etc. If a unit is utilizing an unmarked car, their identifier will include the prefix "unmarked", such as "Unmarked 3-Baker" or "Unmarked Power". Dodge Durango Mutual Aid: EMS units cover multiple alarm districts at all times, and there will never be an ambulance based in all 7 districts. There is no Engine 4, Station 4 on Pennsylvania Avenue is closed. Headquarters, 75 North Martine Ave

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## Chapter 5 : USB2 - Radio communication apparatus - Google Patents

*Powerline communication apparatus used in low voltage installations - Radio disturbance characteristics - Limits and methods of measurement - Part 2: Apparatus for access-network use This part of EN specifies limits and methods of measurement of radio disturbance characteristics for PLC access network communication apparatus that use the.*

DA SA PowerManagement indicates the operation mode of the transmission source apparatus of the data frame in question. MoreData indicates whether or not there is any data frame subsequent to the data frame in question addressed to the radio communication apparatus 20 in power save mode. The transmission processing part adds a header and error detection code such as FCS Frame Check Sequence to various data frames supplied from the data processing part during transmission before supplying the data frames to the radio interface  The transmission processing part also analyzes the header added to various data frames supplied from the radio interface during reception and, if the data frames are verified error-free based on error detection code, supplies the various data frames to the data processing part  The radio interface generates a modulating signal in the frequency band of carriers based on various data frames supplied from the transmission processing part during transmission and causes the antenna 22 to transmit the modulating signal as a radio signal. The radio interface also decodes various data frames by down-converting a radio signal received from the antenna 22 during reception for conversion into a bit string. That is, the radio interlace can function as a transmission part and also as a reception part, in collaboration with the antenna  While only one antenna 22 is shown in FIG. The memory has a role as a work area of data processing by the control part and a function as a storage medium to hold various kinds of data. The control part has functions of a communication control part and a mode control part and controls overall operations of the radio communication apparatus  The communication control part controls communication using a direct link path and that using a base station path by instructing the data processing part to generate various data frames. The communication control part also causes the memory to hold content for example, a communication function held by the partner to which a direct link is set of data frames analyzed by the data processing part when necessary. The communication control part also exercises communication control for transition to the PPSM Client mode, which is a power save mode when a direct link path is in use, and communication control in PPSM Client mode. The mode control part controls the operation mode transition, for example, the transition from the active mode to the PPSM Client mode and that from the PPSM Client mode to the active mode. Then, the data frame is transmitted to the radio communication apparatus 20B as a unicast frame S The mode control part of the radio communication apparatus 20A causes the transition of the operation mode of the radio communication apparatus 20A to the PPSM Client mode using reception of ACK from the radio communication apparatus 20B as a trigger S Similarly, the mode control part of the radio communication apparatus 20B causes the transition of the operation mode of the radio communication apparatus 20B to the PPSM AP mode S That is, when data addressed to the radio communication apparatus 20A is generated in an upper layer, the radio communication apparatus 20B operating in PPSM AP mode buffers the data S Then, when the radio communication apparatus 20A operating in PPSM Client mode wakes up, the radio communication apparatus 20A transmits a trigger frame to the radio communication apparatus 20B S and the radio communication apparatus 20B transmits ACE after receiving the trigger frame S When data of the access category indicated by QosControl of the trigger frame is buffered S , the radio communication apparatus 20B generates a data frame based on the buffered data and transmits the data frame S After receiving the data frame from the radio communication apparatus 20B, the radio communication apparatus 20A sends back ACK S In this manner, the radio communication apparatus 20A operating in PPSM Client mode reduces power consumption by remaining awake during transmission of data frames from the radio communication apparatus 20B and sleeping after receiving the final data frame. If data addressed to the radio communication apparatus 20A is subsequently generated in an upper layer, the radio communication apparatus 20A buffers the data S In the foregoing, management of the operation mode between the radio communication apparatuses 20A and 20B performing communication using a direct link path is described. In reality, however, the radio communication apparatus 20A also has connection relations with the base station 30 and the radio communication apparatus 20C and thus, it is desirable to manage the operation mode by considering relations with the base station 30 and the radio communication apparatus 20C. An operation example of the transition of the radio communication apparatus 20A to the PPSM Client mode by considering, in addition to the radio communication apparatus 20B, the base station 30 and the radio communication apparatus 20C will be described below. First, as shown in FIG. Then, the radio communication apparatuses 20A and 20B perform, direct link setup to have a direct link path validated S , and the radio communication apparatuses 20A and 20C perform direct link setup to have a direct link path validated S At this point, the radio communication apparatuses 20A to 20C and the base station 30 operate in active mode. Hereinafter, when data addressed to the radio communication apparatus 20A is generated in an upper layer, the radio communication apparatus 20B buffers the data S With the above processing, the transition of the radio communication apparatus 20A to the PPSM Client mode is approved between the radio communication apparatuses 20A and 20B. However, if the transition of the radio communication apparatus 20A to the PPSM Client mode occurs at this stage, down-link transmission from the base station 30 that has not yet grasped the transition and transmission from the radio communication apparatus 20C using a direct link path could occur. Thus, the radio communication apparatus 20A according to the embodiment of the present invention enters the PPSM Client mode while maintaining stability of communication by making a specific notification to all the apparatuses communicating using a direct link path and the base station  Hereinafter, when data addressed to the radio communication apparatus 20A is generated, the base station 30 basically buffers the data S Further, it is necessary for the radio communication apparatus 20A to notify the radio communication apparatus 20C with which a direct, link path is validated of the transition to the PPSM Client mode. However, the radio communication apparatus 20C does not support, the PPSM AP mode and thus, switching from a direct link path to a base station path is requested from the radio communication apparatus 20C to prevent transmission of any data frame from the radio communication apparatus 20C in PPSM Client mode. More specifically, the data processing part of the radio communication apparatus 20A first transmits TDLS AP Path Switch Request to the base station 30 based on control by the communication control part S The mode control part of the radio communication apparatus 20A determines whether or not all responses to notification to each communication apparatus have been received S If there is no other communication apparatus having a connection relation, the mode control part of the radio communication apparatus 20A causes the transition of the operation mode of the radio communication apparatus 20A to the PPSM Client mode S In this manner, the mode control part causes the transition of the operation mode to the PPSM Client mode on condition that responses from all communication apparatuses having connection relations have been received. Therefore, in the embodiment of the present invention, the possibility of a data frame being transmitted to the radio communication apparatus 20 operating in PPSM Client mode and sleeping can more reliably be prevented. For example, like a second operation example shown in FIG. Then, the radio communication apparatuses 20A and 20B perform direct link setup to have a direct link path validated S , and the radio communication apparatuses 20A and 20C perform direct link setup to have a direct link path validated S Thus, the radio communication apparatus 20A according to the embodiment of the present invention enters the PPSM Client mode while maintaining stability of communication by making a specific notification to all apparatuses having a connection relation. However, the radio communication apparatus 20C does not support PPSM AP mode and thus, switching from a direct link path to a base station path is requested from the radio communication apparatus 20C to prevent transmission of any data frame from the radio communication apparatus 20C in PPSM Client mode. Switch Request to the base station 30 based on control by the communication control part S If there is no other communication apparatus having a connection relation, the mode control part of the radio communication apparatus 20A causes the transition of the operation mode of the radio communication apparatus 20A to the PPSM Client, mode S The first operation example and the second operation example will be described below. Therefore, to realize the first operation example, described above, setting to exclude TDLS AP Path Switch Response and the like as targets of buffering in the base station 30 can be considered. In contrast, in the second operation example, a notification is made to the base station 30 after the radio communication apparatus 20C that does not support the PPSM AP mode and thus, no special setting in the base station 30 is effective like the first, operation example for realization thereof. The CPU functions as an arithmetic processing unit and also as a control unit and controls overall operations in the radio communication apparatus 20 according to various kinds of programs for example, corresponding to the control part The CPU may be a microprocessor. The RAM primarily stores programs used by the CPU and parameters and the like appropriately changing in execution thereof for example, corresponding to the memory These components are mutually connected by the host bus constituted by a CPU bus or the like. Incidentally, the host bus , the bridge , and the external bus do not have to be necessarily formed separately and these functions may be implemented in a single bus. The input device is configured by an input means for a user to input information such as a mouse, keyboard, touch panel, button, microphone, switch, and lever and an input control circuit that generates an input signal based on input by the user and outputs the input signal to the CPU The user of the radio communication apparatus 20 can input various kinds of data and give instructions on processing operations to the radio communication apparatus 20 by operating the input device The output device outputs, for example, reproduced content. More specifically, the display device displays various kinds of information such as reproduced video data as text or images. The sound output device, on the other hand, converts reproduced sound data and the like into sound and outputs the sound. The storage device is a device for data storage configured as an example of the storage part of the radio communication apparatus 20 according to the embodiment of the present, invention. The storage device may contain a storage medium, a recording device for recording data in the storage medium, a reading device for reading data from the storage medium, and a deleting device for deleting data recorded in the storage medium. The storage device drives a hard, disk and stores programs executed by the CPU and various kinds of data. The drive reads out information recorded in a removable recording medium 24 such as an inserted magnetic disk, optical disk, magneto-optical disk, and semiconductor memory and outputs the information to the RAM The communication device is a communication interface constituted by a communication device or the like for communicating with the base station 30 or the other radio communication apparatuses 20 for example, corresponding to the antenna 22, the radio interface and the like. The communication device may be a radio LAN Local Area Network compliant communication apparatus, wireless USB compliant communication apparatus, or wire communication apparatus that performs communication by wire. Therefore, in the embodiment of the present, invention, the possibility of a data frame being transmitted to the radio communication apparatus 20 operating in PPSM Client mode and sleeping can more reliably be prevented. It should be understood by those skilled in the art that various modifications, combinations, sub-combinations and alterations may occur depending on design requirements and other factors insofar as they are within the scope of the appended claims or the equivalents thereof. In the foregoing, for example, examples in which the base station 30 is independently notified of the transition to the PPSM Client mode even when the radio communication apparatus 20C that does not support the PPSM AP mode is present, but the present invention is not limited to such examples. Each step in processing of the radio communication system 1 described, herein does not have to be necessarily processed chronologically in a sequence shown as sequence diagrams. For example, each step in processing of the radio communication system 1 may contain processing for example, parallel processing or processing by objects performed in parallel or individually. A computer program causing hardware such as the CPU , the ROM , and RAM contained in the radio communication apparatus 20 to function equivalently to each component described above of the radio communication apparatus 20 can be created. A storage medium in which the computer program is stored is also provided. A sequence of processing can be realized by hardware by configuring each functional block shown in the functional block diagram in FIG. The present application contains subject matter related to that disclosed in Japanese Priority Patent Application JP filed in the Japan Patent Office on May 23, , the entire content of which is hereby incorporated by reference.

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## Chapter 6 : Bertolt Brecht, â€œThe Radio as an Apparatus of Communication,â€• | Media and Performanc

*The Radio as an Apparatus of Communication Bertolt Brecht In our society one can invent and perfect discoveries that still have to conquer their.*

Also, for the modulation scheme changeover threshold value, a predetermined value is assumed to be set for each modulation scheme. Thereafter, if the reception level reaches the predetermined modulation scheme changeover threshold value yes in step S2 , the RSL MON1 transmits detected information 1 indicating that the reception level reaches the predetermined modulation scheme changeover threshold value to the MOD CONT1 step S3. In step S2, if the reception level does not reach the predetermined modulation scheme changeover threshold value no in step S2 , the RSL MON1 continues monitoring the reception level step S1. The MOD CONT1 having received the detected information 1 from the RSL MON1 transmits to the MOD1 by use of a free throttle on the radio frame, request information 2 requesting a modulation scheme change to change over the current modulation scheme to another modulation scheme and designation of a transmission level to set the transmission level to a predetermined value to heighten or to lower the level; step S4. The MOD1 sets the contents of the request information 2 as part of modulation signal 3 to transmit the resultant signal via the TX1 to the downlink station 2 step S5. According to the ATPC, the transmission level is lowered if a sufficiently high reception level is sustainable to suppress a degree of interference to other communication lines. If the reception level lowers, the transmission level is heightened to keep a transmission quality. The downlink station 2 receives the modulation signal 3 via the RX2 from the uplink station 1 step S6 , extracts the contents of the request information 2 from the modulation signal 3 by DEM2, and sets the extracted request information as part of a demodulation signal 4 to send the resultant signal to the MOD CONT2 step S7. After the control, the MOD2 sets, as part of a modulation signal 6 , response information indicating that the control is achieved as requested by the request information 2 and then transmits the resultant signal via the TX2 to the uplink station 1 step S The uplink station 1 receives modulation signal 6 via the RX1 from the TX2 of the downlink station 2 step S11 , extracts the response information from the modulation signal 6 by DEM1, and sets the extracted response information as part of a demodulation signal 7 to transmit the resultant signal to the MOD CONT1 step S Thereafter, the steps S1 to S14 are repeatedly executed. Assume that the radio communication system of the exemplary embodiment employs two modulation schemes as in FIG. Next, referring to FIG. In the radio communication system of the exemplary embodiment, to keep a bandwidth to be used fixed, the two modulation schemes employ one and the same modulation rate. That is, the transmission capacity changes by a modulation scheme changeover. Moreover, according to the radio communication system of the exemplary embodiment, in FIG. Of the apparatus input signals, those having high priority are to be transmitted even if the modulation scheme is set to the QPSK. The signals which are transmitted only in the 32QAM have low priority. First, as shown in FIG. The reception level slightly lowers in the slight rain and considerably lowers as the amount of rainfall becomes greater. Incidentally, it is assumed that the ATPC threshold value is set to a predetermined value. Assuming that the level difference is a dB, the transmission level and the reception level discontinuously change at point 2. This a dB corresponds to the maximum transmission level difference restricted by the transmission spectral mask rule for each of the 32QAM and the QPSK. Incidentally, assume that the reception signal is allowed to be once out of synchronization at changeover of the modulation scheme and at heightening of the transmission level difference a dB. Although disconnected, the communication in the QPSK is restored in quite a short period of time. The transmission level reduction control operates as follows. Therefore, during period D of FIG. Through the procedure described above, the radio communication system of the exemplary embodiment sets the scheme to the QPSK as quickly as possible when the reception level is lowered, and can conduct operation to secure a fully high reception level even if the scheme is reset to the 32QAM when the reception level rises. Incidentally, although description has been given of the changeover between the QPSK and the 32QAM in the exemplary embodiment, the combination of modulation schemes is not restricted by this combination. A plurality of modulation schemes may be employed for the change, so that it is also possible to dispose a changeover threshold value for each modulation scheme to achieve the changeover in multiple stages. Moreover, although the modulation rate is fixed in the description of the exemplary embodiment, there may be employed a configuration in which the modulation late is lowered as compared with that in the ordinary state to reduce the bandwidth. That is, this is because there is obtained an advantage to improve the system gain also by changing the modulation scheme and the modulation rate. Additionally, the exemplary embodiment is configured to combine control operations with each other in FIG. Moreover, even when the transmission level control procedure is simplified by setting end point 5 of the transmission level reduction control to the maximum value of ATPC, i. As above, according to the exemplary embodiment, since there is arranged means to beforehand confirm at resetting of the modulation scheme that a sufficient reception level is secured before the resetting, it is possible to lower the probability of the signal interruption due to the resetting. Also, according to the exemplary embodiment, since there is disposed the ATPC, it is possible to reduce the degree of interference to others in the ordinary state. Exemplary Embodiment 2 The radio communication system of the exemplary embodiment includes, in addition to the configuration of exemplary embodiment 1 described above, a Digital Cross Connect DXC function in, for example, the uplink station 1 as shown in FIG. The DXC 3 arbitrarily changes setting for signals with higher priority and for the other signals; the signals with higher priority may be changed by the DXC 3. Therefore, according to the exemplary embodiment, since the DXC 3 is arranged, even if a communication line is added after the operation of the apparatus is started, a signal having higher priority can be arbitrarily set according to necessity. As above, description has been given of exemplary embodiments of the present invention; however, the present invention is not restricted by the exemplary embodiments, but various changes may be made therein without departing from the gist of the present invention. A radio communication apparatus for conducting radio communication with another radio communication apparatus by transmission of continuous signals, comprising: The radio communication apparatus in accordance with claim 1 , further comprising: The radio communication apparatus in accordance with claim 2 , characterized in that in a situation wherein, after the reception level is lowered and reaches the first threshold value, lowering of the reception level is again detected by the reception level detector and the reception level reaches a preset second threshold value, the control unit controls to conduct a changeover from the first modulation scheme to the second modulation scheme and to simultaneously increase the transmission level controlled to be kept at the maximum value further by a predetermined value to keep the transmission level at a fixed value. The radio communication apparatus in accordance with claim 2 , characterized in that in a situation wherein, after the changeover from the first modulation scheme to the second modulation scheme, rising of the reception level is detected by the reception level detector and the reception level reaches the first threshold value, the control unit conducts at least one of the transmission level reduction control and the reception level confirmation control. The radio communication apparatus in accordance with claim 2 , wherein the transmission level reduction control reduces the transmission level controlled to be kept at the maximum value by the control unit, stepwise by a predetermined value down, to a predetermined output level, and the control unit resets, after reducing the transmission level to the predetermined output level by the transmission level reduction control, the second modulation scheme to the first modulation scheme by the modulation scheme changeover control. The radio communication apparatus in accordance with claim 2 , wherein the reception level confirmation control confirms for a fixed period of time that the reception level detected by the reception level detector exceeds the first threshold value, and the control unit resets, after confirming by the reception level confirmation control that the reception level detected by the reception level detector exceeds the first threshold value for a fixed period of time, the second modulation scheme to the first modulation scheme by the modulation scheme changeover control. The radio communication apparatus in accordance with claim 1 , wherein the control unit resets, after conducting at least one of the transmission level reduction control and the reception level confirming control, the second modulation scheme to the first modulation scheme by the modulation scheme changeover control and simultaneously controls by the automatic transmitter power control the transmission level of another radio communication apparatus to set the reception level of the reception signal to be received by the own apparatus to a predetermined value. The radio communication apparatus in accordance with claim 1 , further comprising a digital cross connect unit capable of setting a signal having high priority. The radio communication apparatus in accordance with claim 1 , wherein the control unit conducts the modulation scheme changeover control and modulation rate changeover control to change a modulation rate. A radio communication system in which radio communication is conducted between an uplink station and a downlink station through transmission of continuous signals, the radio communication system comprising: The radio communication system in accordance with claim 10 the uplink station comprises a reception level detector that detects the reception level, wherein in a situation in which lowering of the reception level is detected by the reception level detector, the automatic transmitter power control request unit requests the downlink station to conduct control to increase, until the reception level reaches a preset first threshold value, the transmission level of the downlink station to a maximum value of an output level of the automatic transmitter power control to keep the transmission level at the maximum value. The radio communication system in accordance with claim 11 , wherein the uplink station requests, in a situation wherein, after the reception level is lowered and reaches the first threshold value, lowering of the reception level is again detected by the reception level detector and the reception level reaches a preset second threshold value, the downlink station to conduct control, by the automatic transmitter power control request means unit, to conduct a changeover from the first modulation scheme to the second modulation scheme and to simultaneously increase the transmission level controlled to be kept at the maximum value further by a predetermined value to keep the transmission level at a fixed value. The radio communication system in accordance with claim 11 , wherein the uplink station conducts, in a situation wherein, after the changeover from the first modulation scheme to the second modulation scheme by the modulation scheme changeover means unit, rising of the reception level is detected by the reception level detector means and the reception level reaches the first threshold value, at least one of an operation to request the downlink station to conduct control to stepwise lower by a predetermined value the transmission level controlled to be kept at the predetermined value by the automatic transmitter power control request means and an operation to confirm a state of the reception level for a fixed period of time by the reception level confirmation unit. A radio communication method for conducting radio communication with a radio communication apparatus by transmission of continuous signals, the radio communication method comprising: The radio communication method in accordance with claim 15 , further comprising: The radio communication method in accordance with claim 16 , further comprising, in that in a situation wherein, after the reception level is lowered and reaches the first threshold value, lowering of the reception level is again detected and the reception level reaches a preset second threshold value, a step for controlling to conduct a changeover from the first modulation scheme to the second modulation scheme and to simultaneously increase the transmission level controlled to be kept at the maximum value further by a predetermined value to keep the transmission level at a fixed value. The radio communication method in accordance with claim 16 , further comprising, in that in a situation wherein, after the changeover from the first modulation scheme to the second modulation scheme, rising of the reception level is detected and the reception level reaches the first threshold value, a step for conducting at least one of the transmission level reduction control and the reception level confirmation control. The radio communication method in accordance with claim 15 , further comprising, in that the method resets, after conducting at least one of the transmission level reduction control and the reception level confirming control, a step for resetting the second modulation scheme to the first modulation scheme by the modulation scheme changeover control and simultaneously controlling by the automatic transmitter power control the transmission level of another radio communication apparatus to set the reception level of the reception signal to be received by the own apparatus to a predetermined value. US Radio communication apparatus, radio communication system and radio communication method Active USB2 en Priority

Applications 3.

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### Chapter 7 : History of radio - Wikipedia

*The radio would be the ï¬•nest possible communication apparatus in public life, a vast network of pipes. That is to say, it would be if it knew how to receive as well as to transmit, how to let the listener speak as well as hear, how to bring him into a relationship instead of isolating him.*

AM radio uses amplitude modulation, in which the amplitude of the transmitted signal is made proportional to the sound amplitude captured transduced by the microphone, while the transmitted frequency remains unchanged. Transmissions are affected by static and interference because lightning and other sources of radio emissions on the same frequency add their amplitudes to the original transmitted amplitude. FM broadcast radio sends music and voice with less noise than AM radio. It is often mistakenly thought that FM is higher fidelity than AM, but that is not true. AM is capable of the same audio bandwidth that FM employs. AM receivers typically use narrower filters in the receiver to recover the signal with less noise. In frequency modulation, amplitude variation at the microphone causes the transmitter frequency to fluctuate. Because the audio signal modulates the frequency and not the amplitude, an FM signal is not subject to static and interference in the same way as AM signals. During unusual upper atmospheric conditions, FM signals are occasionally reflected back towards the Earth by the ionosphere , resulting in long distance FM reception. FM receivers are subject to the capture effect , which causes the radio to only receive the strongest signal when multiple signals appear on the same frequency. FM receivers are relatively immune to lightning and spark interference. High power is useful in penetrating buildings, diffracting around hills, and refracting in the dense atmosphere near the horizon for some distance beyond the horizon. A few old, "grandfathered" stations do not conform to these power rules. Such a huge power level does not usually help to increase range as much as one might expect, because VHF frequencies travel in nearly straight lines over the horizon and off into space. Special receivers are required to utilize these services. Analog channels may contain alternative programming, such as reading services for the blind, background music or stereo sound signals. In some extremely crowded metropolitan areas, the sub-channel program might be an alternate foreign-language radio program for various ethnic groups. In some countries, FM radios automatically re-tune themselves to the same channel in a different district by using sub-bands. AM is used so that multiple stations on the same channel can be received. Aircraft fly high enough that their transmitters can be received hundreds of miles away, even though they are using VHF. Government, police, fire and commercial voice services also use narrowband FM on special frequencies. Early police radios used AM receivers to receive one-way dispatches. Civil and military HF high frequency voice services use shortwave radio to contact ships at sea, aircraft and isolated settlements. Viewed as a graph of frequency versus power, an AM signal shows power where the frequencies of the voice add and subtract with the main radio frequency. SSB cuts the bandwidth in half by suppressing the carrier and one of the sidebands. Analog television also uses a vestigial sideband on the video carrier to reduce the bandwidth required. A Reedâ€”Solomon error correction code adds redundant correction codes and allows reliable reception during moderate data loss. Although many current and future codecs can be sent in the MPEG transport stream container format , as of most systems use a standard-definition format almost identical to DVD: High-definition television is possible simply by using a higher-resolution picture, but H. With the compression and improved modulation involved, a single "channel" can contain a high-definition program and several standard-definition programs. Radio navigation All satellite navigation systems use satellites with precision clocks. The satellite transmits its position, and the time of the transmission. The receiver listens to four satellites, and can figure its position as being on a line that is tangent to a spherical shell around each satellite, determined by the time-of-flight of the radio signals from the satellite. A computer in the receiver does the math. Radio direction-finding is the oldest form of radio navigation. Before navigators used movable loop antennas to locate commercial AM stations near cities. In some cases they used marine radiolocation beacons, which share a range of frequencies just above AM radio with amateur radio operators. LORAN systems also used time-of-flight radio signals, but from radio stations on the ground. Very High Frequency Omnidirectional Range VOR , systems used by aircraft , have an antenna array that transmits two signals simultaneously. A directional signal rotates like a lighthouse at a fixed rate. When the directional signal is facing north, an omnidirectional signal pulses. By measuring the difference in phase of these two signals, an aircraft can determine its bearing or radial from the station, thus establishing a line of position. An aircraft can get readings from two VORs and locate its position at the intersection of the two radials, known as a " fix. Radar Radar Radio Detection And Ranging detects objects at a distance by bouncing radio waves off them. The delay caused by the echo measures the distance. The direction of the beam determines the direction of the reflection. The polarization and frequency of the return can sense the type of surface. Navigational radars scan a wide area two to four times per minute. They use very short waves that reflect from earth and stone. They are common on commercial ships and long-distance commercial aircraft. General purpose radars generally use navigational radar frequencies, but modulate and polarize the pulse so the receiver can determine the type of surface of the reflector. The best general-purpose radars distinguish the rain of heavy storms, as well as land and vehicles. Some can superimpose sonar data and map data from GPS position. Search radars scan a wide area with pulses of short radio waves. They usually scan the area two to four times a minute. Sometimes search radars use the Doppler effect to separate moving vehicles from clutter. Targeting radars use the same principle as search radar but scan a much smaller area far more often, usually several times a second or more. Weather radars resemble search radars, but use radio waves with circular polarization and a wavelength to reflect from water droplets. Some weather radar use the Doppler effect to measure wind speeds. The oldest form of digital broadcast was spark gap telegraphy , used by pioneers such Popov [30] or Marconi. By pressing the key, the operator could send messages in Morse code by energizing a rotating commutating spark gap. The rotating commutator produced a tone in the receiver, where a simple spark gap would produce a hiss , indistinguishable from static. Spark-gap transmitters are now illegal, because their transmissions span several hundred megahertz. This is very wasteful of both radio frequencies and power. The next advance was continuous wave telegraphy , or CW Continuous Wave , in which a pure radio frequency, produced by a vacuum tube electronic oscillator was switched on and off by a key. A receiver with a local oscillator would " heterodyne " with the pure radio frequency, creating a whistle-like audio tone. CW is still used, these days primarily by amateur radio operators hams. Radioteletype equipment usually operates on short-wave HF and is much loved by the military because they create written information without a skilled operator. They send a bit as one of two tones using frequency-shift keying. Groups of five or seven bits become a character printed by a teleprinter. From about to , radioteletype was how most commercial messages were sent to less developed countries. These are still used by the military and weather services. Aircraft use a Baud radioteletype service over VHF to send their ID, altitude and position, and get gate and connecting-flight data. Microwave dishes on satellites, telephone exchanges and TV stations usually use quadrature amplitude modulation QAM. QAM sends data by changing both the phase and the amplitude of the radio signal. Engineers like QAM because it packs the most bits into a radio signal when given an exclusive non-shared fixed narrowband frequency range. Usually the bits are sent in "frames" that repeat. A special bit pattern is used to locate the beginning of a frame. Communication systems that limit themselves to a fixed narrowband frequency range are vulnerable to jamming. A variety of jamming-resistant spread spectrum techniques were initially developed for military use, most famously for Global Positioning System satellite transmissions. Commercial use of spread spectrum began in the s. Bluetooth , most cell phones, and the  Systems that need reliability, or that share their frequency with other services, may use "coded orthogonal frequency-division multiplexing" or COFDM. COFDM breaks a digital signal into as many as several hundred slower subchannels. The digital signal is often sent as QAM on the subchannels. Modern COFDM systems use a small computer to make and decode the signal with digital signal processing , which is more flexible and far less expensive than older systems that implemented separate electronic channels. An adaptive system, or one that sends error-correction codes can also resist interference, because most interference can affect only a few of the QAM channels.

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Radio-frequency heating Radio-frequency energy generated for heating of objects is generally not intended to radiate outside of the generating equipment, to prevent interference with other radio signals. Microwave ovens use intense radio waves to heat food. Diathermy equipment is used in surgery for sealing of blood vessels. Amateur radio service[ edit ] Amateur radio station with multiple receivers and transceivers Amateur radio , also known as "ham radio", is a hobby in which enthusiasts are licensed to communicate on a number of bands in the radio frequency spectrum non-commercially and for their own experiments. They may also provide emergency and service assistance in exceptional circumstances. This contribution has been very beneficial in saving lives in many instances. Several forms of radio were pioneered by radio amateurs and later became commercially important, including FM, single-sideband SSB , AM, digital packet radio and satellite repeaters. Some amateur frequencies may be disrupted illegally by power-line internet service. Similar services exist in other parts of the world. These radio services involve the use of handheld units. Wi-Fi also operates in unlicensed radio bands and is very widely used to network computers. Free radio stations, sometimes called pirate radio or "clandestine" stations, are unauthorized, unlicensed, illegal broadcasting stations.

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## Chapter 8 : Sigtronics Corporation Emergency Apparatus Communication Products

*FIRE APPARATUS INTERCOM SYSTEM The existing 2-way radio in the apparatus. and has a Red PTT for radio communication.*

The present invention further relates to a method for testing and a computer program product. Hereinafter, the present invention and its underlying problem are described on the basis of such user equipment, however, without restricting the invention to this sort of devices. In particular, the term user equipment should be used in the context of this application explicitly for any radio-based mobile or wireless end-to-end communication device, such as a cell phone, a smart computer, a laptop computer equipped with a mobile broadband adapter or the like. The growing functionality of modern user equipment gives rise to testing these devices. If a user equipment is tested in a real environment, such as a real radio communications network, the conditions are often not reproducible due to the limiting conditions such as cell capacity, timing, utilisation, etc. In this respect it makes sense to test user equipment in a reproducible test environment. For this purpose, dedicated test apparatusâ€"also denoted as test devices or test instrumentsâ€"for testing such user equipment exist. Such test apparatus are used to test user equipment by measuring physical parameters or transmitted signals. DE 10 A1, for example, describes the operating principle of a test apparatus of this type. Such a test apparatus is in principle an RF test station, which is a modified small transceiver base station of a mobile communications network. The test apparatus can emulate a specific test network according to the required mobile communications standard such as for example a GSM, UMTS or LTE network, so that the test can be performed under realistic conditions. This type of test apparatus is used in order to test the RF properties of a user equipment under test, for instance its transmit and receive capability, or whether a particular user equipment is behaving as required, for example with regard to data throughput, data volume, communications partners servers , etc. More and more communication is related to communication in a mixed cellular and Device-to-Device D2D communications environment. In particular, D2D communication has been promoted as a means to provide peer-to-peer services between user equipments, facilitate infrastructure-less communications in emergency situations and to enhance network capacity by offloading traffic from the radio communications network. Current test apparatus are capable to emulate the functionality of a common transceiver base station only. However, with the upcoming D2D communication capabilities of user equipments, the need arises to test the user equipment under these conditions, too. According to a second aspect of the present invention, a test apparatus radio communication test apparatus for testing user equipment is provided, the test apparatus comprising: According to a third aspect of the present invention, a method for testing user equipment by employing a test apparatus is provided, the method comprising: According to a fourth aspect of the present invention, a computer program product is provided, the computer program product comprising instructions to perform testing a user equipment under test by emulating the functionality of a first user equipment, establishing a wireless or wired D2D link between the emulated first user equipment and a provided second user equipment under test and, after establishing the D2D link, testing the second user equipment. In one embodiment, the computer program product includes a non-transitory computer readable medium on which processor executable instructions are stored. With the test apparatus and test method according to the present invention, it is now possible to test user equipment and other devices such as base stations also for the upcoming D2D communication standard. In particular, it is possible to test devices under test such as user equipment and measure their physical parameters and properties under various scenarios, such as full cellular coverage, partial cellular coverage and out-of coverage. This is done by employing specific emulation and test modules within the test apparatus. The emulation module is in particular capable to emulate the functionality of any user equipment and to provide for test purposes a D2D link from the emulated user equipment to any user equipment under test. The test module is then capable to test properties of the established D2D link and the corresponding functionality of the user equipment or devices under test. Specific embodiments of the present invention are set forth in the dependent claims. These and other aspects of the present invention will be apparent from and elucidated with reference to the embodiments described hereinafter. The invention is explained in more detail below using exemplary embodiments of the different aspects of the present invention which are specified in the schematic figures of the drawings in which: The enclosed drawings are intended to provide further understanding of the embodiments of the invention. They illustrate embodiments and, in conjunction with the description, serve to explain principles and concepts of the invention. Other embodiments and many of the stated advantages can be found from the drawings. The elements of the drawings are not necessarily shown in scale with one another. In the figures of the drawing, any elements and components that are identical, have the same function and work in the same way, are each given the same reference signs, unless stated otherwise. The mixed communications environment comprises a D2D radio network 1 and a cellular communications network 2, i. The D2D radio network 1 is a communication network wherein two or more user equipments 5, 6 or other devices, in the examples in FIGS. One such example is a network using a master-and-slave concept, such as e. The D2D radio network 1 may be used to provide peer-to-peer services between user equipments 5, 6, facilitate infrastructure-less communications in emergency, and the like. The D2D radio network 1 is established by two user equipments 5, 6 which are communicating with each other. The cellular communications network 2 is established via at least one radio transceiver base stations 3, 4. These networks may comprise base stations of different classes, such as macro base stations, home base stations or pico base stations. The first and second user equipment 5, 6 may be a terminal, e. Typically, but not necessarily, both first and second user equipment 5, 6 are capable of both communications, i. In embodiments wherein the D2D radio network 1 uses a master-and-slave concept, one of the communicating user equipments 5, 6 takes the master role and closely emulates a base station such as LTE eNB. For example, the second user equipment 6 may be a master device and the first user equipment 5 may be a slave device, however, it may also be the other way around. According to a first mixed communications environment FIG. This scenario is hereinafter referred to as in-coverage, intra cell communication as both user equipments 5, 6 are fully comprised in the same cellular communications network 2. The first user equipment 5 is configured to communicate within the cellular communications network 2 via the base station 3 over a radio link 7 when the first user equipment 5 is present in a cell served by this base station 3. The base station 3 may e. The first user equipment 5 is further arranged to communicate with the second user equipment 6 over a D2D radio link 8 within the D2D radio network 1. The second user equipment 6 may further be connected to the cellular communication system 2 via a connection 9. This connection 9 may serve for coordination of the whole communication. According to a second mixed communications environment FIG. This scenario is hereinafter referred to as in-coverage, inter-cell communication. Here, the first user equipment 5 is arranged in a first cellular communications network 2 and communicates with a first cellular communications network 2 via radio link 7. A second user equipment 6 is arranged in a second, different cellular communications network 2a and communicates with the second cellular communications network 2a via connection 9. The user equipments 5, 6 are configured to communicate with each other via the D2D radio link 8. According to a third mixed communications environment FIG. This scenario is hereinafter referred to as out-of-coverage communication. Here, the both user equipments 5, 6 are arranged only within the D2D radio network 1. This D2D radio network 1 may be established by the first user equipment 5, the second equipment 6 or both of them. Thus, both user equipments 5, 6 are connected to each other only via the D2D radio link 8. According to a fourth mixed communications environment FIG. This scenario is hereinafter referred to partial coverage communication. In this scenario, the second user equipment 6 is connected to the first user equipment 3 only via the D2D link 8. The first user equipment 5 is further connected to the base station 3 via the radio link 7. A link 9 between the base station 3 and the second user equipment serves only for data coordination purposes. The test apparatus 10 shown in FIG. In other embodiments it may also be possible that the test apparatus 10 is designed to perform wired testing. The radio communication test apparatus 10 shown in FIG. In addition to testing the pure mobile communications properties of a user equipment, the test apparatus 10 according to the invention may also designed to test IP properties of a user equipment or other devices such as base stations. The test apparatus 10 comprises an emulation module 11 and a test module  In a further specific embodiment the emulation module 11 and test module 12 areâ€"fully or partiallyâ€"implemented in the same programmable circuit. In the embodiment of FIG. For this purpose, the emulation module 11 is configured to establish a wireless D2D link 14 between the emulated user equipment and an externally arranged, real user equipment 13 which forms a device under test DUT. The D2D link 14 between the test apparatus 10 and the user equipment 13 allows a bidirectional signal transfer between the two components 10, 13 of the test system. The communication link 14 between the test apparatus 10 and the user equipment under test 13 allows a bidirectional signal transfer between the two components of the test system. The test module 12 is configured to measure and analyse the signal transfer of the data communication and especially the physical properties of the signal received from the user equipment  In order to properly conduct the measurement and analysis and hence not to negatively affect the signal transfer between user equipment 13 under test and test apparatus 10, the test module 12 is able to act merely as an observer. In an additional embodiment, the emulation module 11 is also configured to emulate the functionality of a radio transceiver base station. This way, the emulation module 11 is configured to establish a radio communication link 15 between the emulated radio transceiver base station and the externally arranged user equipment  The communications standard used here is typically defined by the transceiver base station. In test mode, the emulation module of the test apparatus 10 according to the invention generates an RF test field in which the user equipment 13 is positioned. To test the pure mobile communications properties of the user equipment 13, it is merely necessary that the test apparatus 10 is connected to the user equipment 13 via the radio communication link  Test communication between user equipment 13 and test apparatus 10 can be initiated by the user equipment 13 or by the test apparatus  By means of these connection 14 and 15, the test apparatus 10 can test and evaluate the properties of the user equipment 13 and in particular the D2D communication properties and radio communication properties as well as their interaction when used simultaneously. For testing the mobile communication properties of the user equipment 13 under test, the signals captured by the test module 12 are measured and evaluated with respect to the parameters under investigation. For this purpose, the test module 12 comprises an RF measurement unit which is designed to test the RF properties of the user equipment 13 under test. An RF measurement unit within the test module 12 can be used for example to determine the RF resources needed in the mobile communications network over a defined time period. In addition, the quality of the radio interface 15 and D2D interface 14 between user equipment 13 and test apparatus 10 can be measured and evaluated. In performing such an RF test, after connecting the test apparatus 10 to the user equipment 13, the specific test procedures and routines are carried out in order to verify in particular that the transmit and receive capability of the mobile communications terminal 3 complies with the specifications required for proper operability. The test involves testing for example the functionality and performance of the user equipment 13, the data transfer and, for example, also the interoperability with other UEs. During the test, the user equipment 13 under test receives, interprets and processes signals, and transmits back response signals which are detected by a receiver within the test module  The test module 12 interprets these signals and compares them with the expected values and signals. A typical measurement and analysis as part of the RF test is the analysis of the bit error rate, which can be used to verify the functionality and quality of a radio transmission component of the user equipment  For example for this purpose, data is transmitted from the emulation module 11 to the user equipment 13, and then transmitted back again from the user equipment 13 to the test apparatus 1. This data can then be checked to ensure it has not been corrupted. In particular, a simplified overall result of the test can also be output, for instance test passed or test not passed. The test module 12 can be used to evaluate the data and signal sequences captured in a data transfer with regard to specific parameters. In a specific embodiment, the test module 12 comprises a measurement unit that is designed to measure at least one of following items of information of the user equipment 13 under test:

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## Chapter 9 : Radio communication apparatus - KABUSHIKI KAISHA TOSHIBA

*The Sabrecom 2 is a unique ATEX approved radio communications interface that fully integrates with your choice of Scott Safety facemasks and a wide selection of two way calendrierdelascience.comble as a complete communications solution with the followi.*