

**CLASS 455, TELECOMMUNICATIONS****SECTION I - CLASS DEFINITION**

This is the generic class for modulated carrier wave communications not elsewhere classifiable.

Some art areas excluded from this class are: Alternating or pulsating current telegraphy; Antennas; Broadcast or multiplex stereo; Condition responsive indicating systems with a radio coupling link; Directive carrier wave systems; Multiplex carrier wave communications; Paging via modulated carrier wave; Pulse or digital communications which may be modulated onto a carrier wave; Reflected carrier wave systems (e.g., radar); Selective (e.g., remote control); Telemarketing; Television; Facsimile. (See References to Other Classes, below, for class references.)

**SECTION II - LINES WITH OTHER CLASSES AND WITHIN THIS CLASS**

The combination of the subject matter of this class (455) and other art environment is generally classified with the other art environment where that environment is significant by virtue of the claimed relationship. For example: Directive systems; Geophysical systems; Radar systems; Radio remote control systems; Telegraph systems; Telemetering systems; Television systems; Facsimile systems (See References to Other Classes, below.)

Subcombinations specific to a modulated carrier wave communication system are classified herein unless classified elsewhere. For example: Demodulation and detector, oscillators, per se, Modulators, per se, and tuners, per se, are classified elsewhere. (See References to Other Classes, below.)

- (1) Note. The classification lines between this class (455) and the related subcombinations classes are found in the class definitions of these subcombination classes.

**ORGANIZATION OF THIS CLASS**

Subclasses 1-355 of this class (455) are limited to radio wave communication systems in which the carrier wave is modulated by a continuous (analog) signals. These subclasses exclude:

(A) Remote control of an external device which is classified in Class 340, subclasses 825-825.98.

(B) Multiplexing of signals which represent intelligence; see Class 370.

(C) Pulse or digital signals which represent intelligence; see Class 375.

The above subclasses may include pulse signals which are used to control a transmitter or receiver; however, where the information content is represented by a pulse or digital signal, classification is in Class 375. Subclass 899 of this class (455) is miscellaneous analog or pulse modulation carrier wave communication not elsewhere classified, for example, modulated protons, muons, or neutrino particles utilized for communication of information.

**SECTION III - REFERENCES TO OTHER CLASSES****SEE OR SEARCH CLASS:**

- 33, Geometrical Instruments, for geometrical type measuring instruments that may employ carrier wave telemetering links.
- 73, Measuring and Testing, which class may include carrier wave telemetric links.
- 178, Telegraphy, subclasses 66.1+ for alternating or pulsating current telegraphy. (See Lines With Other Classes and Within This Class, Art Areas Excluded From This Class.)
- 178, Telegraphy, for telegraph systems. (See Lines With Other Classes and Within This Class, Combination of The Subject Matter of This Class (455) and Other Art Environment.)
- 178, Telegraphy, provides in subclasses 2+ for various telegraph systems comprising means for transmitting mark and space or coded telegraph messages between stations and including a plurality of telegraph instruments, such as transmitting and receiving instruments in circuit, and indented subclass 49 for superimposed current systems.
- 246, Railway Switches and Signals, appropriate subclasses for carrier wave railway signalling systems, particularly subclasses 2+ for train dispatching systems; indented subclasses 7+ providing for telegraphy or telephony; subclasses 20+ for block-signal systems; and subclasses 167+ for cab signal or train control systems.
- 257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), appropriate subclasses for integrated circuit structure, bipolar, and field

- effect transistors (or combinations thereof), light emitting injection diodes, and other light emitting devices, etc.
- 330, Amplifiers, for demodulation and detector, per se.
- 331, Oscillators, for oscillators, per se.
- 332, Modulators, for modulators, per se.
- 334, Tuners, for tuners, per se.
- 340, Communications: Electrical, subclasses 7.1 through 7.63 for paging via modulated carrier wave; subclass 311.2 for nonselective paging; subclasses 539.1-539.32 for condition responsive indicating systems with a radio coupling link; subclasses 825-825.98 for means for controlling the operations of a signaling device or devices in a selective manner over a lesser number of communication lines than the number of different results which can be obtained by signaling over said lines and which may contain transmission and receiving means in circuit (radio remote control systems), especially subclass 825.69 for a radio link in pulse responsive selection actuation; and subclasses 870.01-870.44 for telemetering systems in which the received signal is at any instant proportional to a condition at the transmitter.
- 342, Communications: Directive Radio Wave Ssystems and Devices (e.g., Radar, Radio Navigation), subclasses 350+ for directive carrier wave systems.
- 343, Communications: Radio Wave Antennas, subclasses 5+ for reflected carrier wave systems (e.g., radar); subclasses 100+ for directive radio wave systems; subclasses 700+ for antennas.
- 348, Television, for television systems.
- 358, Facsimile and Static Presentation Processing, for facsimile systems.
- 367, Communications, Electrical: Acoustic Wave Systems and Devices, for geophysical systems, for signalling by means of mechanical or compressional waves, such as sound or supersonic waves. See subclasses 87+ for echo systems; and subclasses 131+ for underwater systems.
- 370, Multiplex Communications, for multiplex communication systems which may include modulated carrier wave systems.
- 375, Pulse or Digital Communications, is the generic class for pulses modulated onto a non-light wave carrier; see subclasses 222+, 259+, 301, 303, 321, 322+, and 338+.
- 379, Telephonic Communications, for a two-way electrical transmission of intelligible audio information over an electrical conductor.
- 380, Cryptography, subclasses 255 through 276 for a communication system using cryptography.
- 381, Electrical Audio Signal Processing Systems and Devices, subclasses 1+ for broadcast or multiplex stereo.
- 398, Optical Communications, various subclasses for optical communication.
- 399, Electrophotography, subclass 8 for remote monitoring of an electrophotographic device.
- 463, Amusement Devices: Games, subclasses 1+, especially subclasses 39 and 40+, for a non-projectile game with telecommunication means.
- 505, Superconductor Technology: Apparatus, Material, Process, subclasses 150+ for high temperature ( $T_c$  30 K) superconducting devices, particularly subclasses 202+ for electrical communication systems.
- 709, Electrical Computers and Digital Processing Systems: Multicomputer Data Transferring, subclasses 200+ for data transferring among a plurality of spatially distributed computers or digital data processing systems.
- 714, Error Detection/Correction and Fault Detection/Recovery, appropriate subclasses for generic error checking.

## SECTION IV - GLOSSARY

### MODULATED CARRIER WAVE

A wave resulting when the necessary characteristics of an intelligence or information signal are impressed on a carrier wave.

### RADIOTELEPHONE SYSTEM

A system for establishing a voice communication link between a base and a mobile transceiver via a wireless carrier wave channel that is allocated for use during a communication link, and wherein the mobile transceiver has a specific assigned call address number.

### TELECOMMUNICATIONS

All types of communications systems in which electric or electromagnetic signals are used to transmit modulated carrier wave information between points. The transmission media is via radio wave generally of a frequency above human speech, yet at a frequency lower

than infrared frequencies. Radiotelephonic communication via wireless link is included in this class.

#### SUBCLASSES

### 1 INTERFERENCE SIGNAL TRANSMISSION (E.G., JAMMING):

This subclass is indented under the class definition. Subject matter including means to transmit an interference signal to interfere with a selected signal so as to prevent the intelligible reception of the selected signal.

- (1) Note. The combination of an interference transmitter with a receiver to select the frequency of the incoming signal it is desired to jam or block, and control means to tune the transmitter to said frequency, is classified in this subclass when the receiver serves solely to determine the frequency of the incoming signal and to control the transmitter. If the receiver portion of the combination is complete (reproduces the intelligence received) the combination is a transceiver and is classified in this class (455), subclasses 73+.
- (2) Note. Antijamming devices or methods are not classified here, but are found in subclasses 296+.

#### SEE OR SEARCH CLASS:

- 343, Communications: Radio Wave Antennas, subclass 18 for jamming or radar transmissions.
- 380, Cryptography, subclasses 252 through 254 for concealment of information by masking of an information bearing signal.

### 2.01 AUDIENCE SURVEY OR PROGRAM DISTRIBUTION USE ACCOUNTING:

This subclass is indented under the class definition. Subject matter including means for indicating, metering, or recording the number of receivers using a radio program, the length of time that a radio program is being used, which of several radio programs is being used, or which radio programs have been broadcast.

- (1) Note. This subclass is provided for generic devices of this type. Use survey and accounting systems which are

designed for a specific type of signal such as television are not classified here but in the class appropriate thereto.

#### SEE OR SEARCH THIS CLASS, SUBCLASS:

- 3.01+, for wireless program distribution systems.
- 26.1, for systems to prevent unauthorized use of a signal.

#### SEE OR SEARCH CLASS:

- 380, Cryptography, appropriate subclasses for a cryptographic system to prevent unauthorized use of a signal.
- 725, Interactive Video Distribution Systems, subclasses 1 through 8 for billing in a video distribution system and subclasses 9-24 for surveying of receiver use, commercial or program airing verification, and awarding coupon, token, or credit, respectively.

### 3.01 WIRELESS DISTRIBUTION SYSTEM:

This subclass is indented under the class definition. Subject matter including an organized arrangement of transmission links for connecting a plurality of discrete subscribers to a source of information signals.

- (1) Note. This subclass and its indents are intended to collect devices, such as community antennas (inclusive of wireless local loop or WLL) and national or global networks.
- (2) Note. Distribution systems including WLL which emphasize a specific type of signal such as television or digital are not classified here but rather in the appropriate class thereto.
- (3) Note. Police, fire, and other radiotelephone systems which may include some elements of a distribution system are classified elsewhere. See the search notes below.

#### SEE OR SEARCH THIS CLASS, SUBCLASS:

- 3.05, for two-way wireless local loop.
- 132, for plural receivers.
- 149, for a plural output receiver.

- 272, for plural separate wave collectors combined with a receiver.
- 500 through 528 and 59-72, for plural transmitters or receivers at separated stations (e.g., police, fire, and other radiotelephone systems which may include some elements of a distribution system).

**SEE OR SEARCH CLASS:**

- 307, Electrical Transmission or Interconnection Systems, subclasses 11 through 87 for like systems without limitation of radiant energy path or analog carrier wave.
- 315, Electric Lamp and Discharge Devices: Systems, subclasses 39 and 39.3 for like systems with discharge devices.
- 327, Miscellaneous Active Electrical Non-linear Devices, Circuits, and Systems, subclasses 365 through 508 for miscellaneous gating systems.
- 333, Wave Transmission Lines and Networks, subclasses 1 through 137 for plural channel systems.
- 340, Communications: Electrical, subclasses 825 through 825.98 for selective systems with distribution characteristics.
- 343, Communications: Radio Wave Antennas, subclasses 850 through 865 for an antenna, per se, with coupling network.
- 375, Pulse or Digital Communications, appropriate subclasses for distribution systems designed for a specific type of digital signal.
- 725, Interactive Video Distribution Systems, for appropriate subclasses.

**3.02 Receiver for satellite broadcast:**

This subclass is indented under subclass 3.01. Subject matter including an antenna for receiving satellite transmissions.

**3.03 Remote control of distribution:**

This subclass is indented under subclass 3.01. Subject matter wherein some functions of a modulated carrier wave source or receiver are supervised or controlled from a remote site.

- (1) Note. Because of a search note in subclass 3.05, only disclosures of more than

mere control in the second directions should be cross referenced thereto.

**SEE OR SEARCH THIS CLASS, SUB-CLASS:**

- 8, for repeater system with failure compensation.
- 26.1, for unauthorized use prevention systems.
- 31.1 through 38.5, for systems with additional selectively responsive means.
- 68 through 72, for control of communication system.
- 88, for transceiver controlling a separate transceiver or receiver.
- 92, for remote control of a transmitter.
- 132, for plural receivers of which one controls another.
- 352 through 355, for remote control of a receiver.

**SEE OR SEARCH CLASS:**

- 340, Communications: Electrical, subclasses 825.69 and 825.72 for remote control over a radio link.
- 380, Cryptography, appropriate subclasses for a cryptographic system to prevent unauthorized use of a signal.

**3.04 With subscriber selection or switching:**

This subclass is indented under subclass 3.03. Subject matter including means for a subscriber to selectively receive desired information signals.

**SEE OR SEARCH CLASS:**

- 340, Communications: Electrical, subclasses 825 through 825.98 for generic selective systems.

**3.05 Two-way:**

This subclass is indented under subclass 3.01. Subject matter including means for establishing communication in both directions.

- (1) Note. Wherein the second communication is the notation or reporting of the program watched or listened to, classification is in audience survey and use accounting.

- (2) Note. Wherein any communication in a system is in pulse form, such system is

classified elsewhere. See the search notes below.

- (3) Note. Wherein any communication in a system is in the form of light waves, such system is classified elsewhere.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

2.01, for audience survey and use accounting.

SEE OR SEARCH CLASS:

340, Communications: Electrical, subclasses 310.11 through 310.18 and 538 through 539.17 for carrier current or other combined systems without the limitations of this class.

359, Optical: Systems and Elements, subclasses 109 through 195 for an information signal transmitted between an optical transmitter and optical receiver by means of variation in a characteristic of light waves.

375, Pulse or Digital Communications, for communication in a system in pulse form.

**3.06 Combined with diverse art device (e.g., audio/sound or entertainment system):**

This subclass is indented under subclass 3.01. Subject matter wherein the distribution system is combined with another art device.

SEE OR SEARCH CLASS:

340, Communications: Electrical, subclass 825.24 for selective program control of audio system and subclass 825.25 for selective control of audio system by pulse signal.

381, Electrical Audio Signal Processing Systems and Devices, subclasses 2 through 18 for stereo broadcasting and subclasses 77-85 for one-way audio signal program distribution.

**7 CARRIER WAVE REPEATER OR REPLAY SYSTEM (I.E., RETRANSMISSION OF SAME INFORMATION):**

This subclass is indented under the class definition. Subject matter comprising means whereby a radiant energy signal wave is received and reradiated at the same or different

carrier frequency and usually at a higher energy level and/or in a desired direction.

- (1) Note. Where the transmitted signal has a different characteristic than the received signal or involves the addition or subtraction of information classification is not in this subclass, but in Class 343 (see notes under subclass 6.5 in the class definition of Class 343). However, if the transmitted signal is on a different carrier frequency from the received signal merely to avoid interference classification is in this subclass.

SEE OR SEARCH CLASS:

178, Telegraphy, subclasses 70+ for repeaters specific to telegraphy.

330, Amplifiers, for amplifiers systems in general, particularly subclass 10 for modulator-demodulator type amplifiers for amplifying direct current or slowly varying alternating current signals.

332, Modulators, particularly subclasses 183+ for modulation converters for converting one modulated wave to a differently modulated wave (e.g., pulse modulation to frequency modulation or frequency modulation to amplitude modulation); subclass 108 for plural stage modulation systems wherein each stage is of the same or diverse type of modulation, the last stage being of the pulse modulation type; subclasses 119+ or 145, for plural stage modulation systems wherein the last stage is of the phase or frequency modulation type; and subclasses 151+ for plural stage modulation systems wherein the last stage is of the amplitude modulation type.

333, Wave Transmission Lines and Networks, subclass 117 for hybrid-type networks.

340, Communications: Electrical, subclass 291 for signal box repeaters which repeat, for example, signals received at a central station to a plurality of fire houses.

343, Communications: Radio Wave Antennas, subclasses 5+ for systems and apparatus which include a

- receiver-transmitter station designed for control by a wave transmitted from a first transmission station and designed to transmit a signal which is different from the received signal, i.e., adds additional information, the system including means to receive the signal transmitted by the receiver transmitter station. Where the signal which is transmitted by the receiver-transmitter is of the same character as the received signal, even though a time-delay is interposed between the time of reception and the time of transmission, the patent is classified in this subclass.
- 370, Multiplex Communications, subclasses 274, 279, 293, 315+, and 492+ for repeaters using multiplex frequency channels.
- 8 Failure compensation (e.g., spare channel):**  
This subclass is indented under subclass 7. Subject matter including apparatus for compensating for failure in operation of a repeater station.
- 9 Monitoring:**  
This subclass is indented under subclass 7. Subject matter including means for measuring or testing the operating condition at a repeater station.
- 10 Fading compensation:**  
This subclass is indented under subclass 9. Subject matter where the measured quantity is the strength of the received signal and variations in said received signal strength are compensated for.
- 11.1 Portable or mobile repeater:**  
This subclass is indented under subclass 7. Subject matter wherein a receiving or transmitting station is not permanently mounted in one location, but is either carried by a person or associated with a movable object, such as a vehicle (i.e., mobile repeater station).
- 12.1 Space satellite:**  
This subclass is indented under subclass 11.1. Subject matter wherein the repeater or relay is associated with an artificial satellite orbiting the earth.
- SEE OR SEARCH CLASS:  
342, Communications: Directive Radio Wave Systems and Devices (e.g., Radar, Radio Navigation), subclasses 352+ which include a satellite.  
343, Communications: Radio Wave Antennas, digest 2 for satellite mounted antenna.  
370, Multiplex Communications, subclasses 316+ for a space satellite repeater using communication techniques.
- 13.1 With plural repeater or relay systems:**  
This subclass is indented under subclass 12.1. Subject matter having more than one modulated carrier wave and having a repeater or a relay for each modulated carrier wave.
- (1) Note. The subject matter of this subclass is limited to plural single channel repeaters; whenever plural independent messages are simultaneously transmitted, classification is elsewhere.
- SEE OR SEARCH CLASS:  
370, Multiplex Communications, for plural independent messages are simultaneously transmitted,
- 13.2 Synchronizing of satellites or system:**  
This subclass is indented under subclass 12.1. Subject matter wherein stations in a system are regulated such that each transmits a carrier wave of the same frequency and phase as those carriers transmitted by the other stations.
- SEE OR SEARCH CLASS:  
370, Multiplex Communications, subclass 324 for time division multiple access synchronization of space satellites.  
375, Pulse or Digital Communications, subclasses 354+ for digital network synchronization.
- 13.3 With antennas feed network or multiple antennas switching:**  
This subclass is indented under subclass 12.1. Subject matter wherein the space satellite has more than one antenna or has a regulation means to control the selection of an antenna.

## SEE OR SEARCH CLASS:

343, Communications: Radio Wave Antennas, subclasses 705+ for antennas with aircraft.

**13.4 Power control:**

This subclass is indented under subclass 12.1. Subject matter including means to regulate the output power in the satellite system.

**14 With transmission line:**

This subclass is indented under subclass 7. Subject matter where the repeater or relay is inserted in a waveguide or other type of transmission line.

**15 Two separate way transmission:**

This subclass is indented under subclass 7. Subject matter where the relay or repeater operates in at least two directions.

## SEE OR SEARCH CLASS:

178, Telegraphy, subclasses 71.1+ for automatic two-way repeaters specific to telegraphy.

370, Multiplex Communications, subclasses 276+ for duplex communications.

**16 Simultaneous using plural repeaters at each location:**

This subclass is indented under subclass 15. Subject matter where the repeater operates in at least two directions at the same time by means of a plurality of repeaters at the same location.

**17 Plural modulated carriers:**

This subclass is indented under subclass 7. Subject matter wherein there is more than one modulated carrier wave being repeated or relayed at the same time.

## SEE OR SEARCH CLASS:

370, Multiplex Communications, subclasses 204+ for plural diverse modulation techniques.

**18 With delay or recording:**

This subclass is indented under subclass 7. Subject matter including a device to time delay or make a permanent record of the modulated carrier wave.

## SEE OR SEARCH CLASS:

327, Miscellaneous Active Electrical Non-linear Devices, Circuits, and Systems, subclasses 261+ for miscellaneous output waveform production delay.

333, Wave Transmission Lines and Networks, subclasses 138 through 164 for passive delay networks.

**19 Common antenna:**

This subclass is indented under subclass 7. Subject matter where the modulated carrier wave is received and transmitted on the same antenna.

**20 With frequency conversion:**

This subclass is indented under subclass 7. Subject matter including apparatus to change the frequency of the modulated carrier wave.

- (1) Note. For classification in this subclass it is not necessary that the carrier frequency of the transmitted signal be different from the carrier frequency of the received signal. For example, the frequency of the received carrier wave may be converted to a lower frequency for purposes of amplification and then be reconverted to the original frequency for transmission.

## SEE OR SEARCH CLASS:

327, Miscellaneous Active Electrical Non-linear Devices, Circuits, and Systems, subclasses 113+ for miscellaneous frequency control or conversion.

331, Oscillators, subclasses 37+ for means to produce a beat frequency by combining the output of two or more oscillators.

332, Modulators, appropriate subclasses for frequency conversion modulation systems, per se.

**21 With demodulator:**

This subclass is indented under subclass 20. Subject matter including apparatus for removing the intelligence from the received signal.

## SEE OR SEARCH CLASS:

329, Demodulators, for demodulators, per se.

- 330, Amplifiers, subclass 10 for direct current or low frequency alternating current amplifiers of the modulator-demodulator type.
- 22 Plural conversion stages:**  
This subclass is indented under subclass 20. Subject matter including more than one successive conversion stage.
- SEE OR SEARCH CLASS:  
332, Modulators, especially subclasses 108, 119+, 145, and 151+ for plural modulation stage modulators.
- 23 Frequency or phase modulation:**  
This subclass is indented under subclass 7. Subject matter where the carrier wave is modulated by varying its frequency or phase in accordance with the information signal.
- SEE OR SEARCH CLASS:  
329, Demodulators, subclasses 315+ for frequency demodulators and subclasses 345+ for phase demodulators.  
332, Modulators, subclasses 183+ for modulation converters (e.g., FM. to A.M.); and subclasses 144+ and 117+ for phase or frequency modulators, per se.
- 24 Transmitter-receiver feedback compensation:**  
This subclass is indented under subclass 7. Subject matter including apparatus to prevent unwanted feedback between the transmitter and the receiver.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
78, for a transceiver with transmitter-receiver interaction prevention.
- SEE OR SEARCH CLASS:  
327, Miscellaneous Active Electrical Non-linear Devices, Circuits, and Systems, subclass 593 for miscellaneous oscillation prevention.  
330, Amplifiers, subclasses 75+ for amplifiers with feedback means including negative feedback for preventing oscillation.
- 370, Multiplex Communications, subclasses 278 and 282+ for transmit/receive interaction control in duplex communications.
- 25 Directive antenna:**  
This subclass is indented under subclass 7. Subject matter including an antenna which is more responsive in one direction than in another.
- SEE OR SEARCH CLASS:  
343, Communications: Radio Wave Antennas, subclass 18 for structure for reflecting radio waves; subclasses 100+ for means for sending and/or receiving radio wave energy which is characterized by some quality that varies according to the relative direction, position and/or plane or polarization of the sender and receiver; and subclasses 700+ for antennas, per se, including directional antennas and antennas combined with reflecting and/or refracting means.
- 26.1 USE OR ACCESS BLOCKING (E.G., LOCKING SWITCH):**  
This subclass is indented under the class definition. Subject matter which blocks access to a signal source or otherwise limits usage of modulated carrier equipment.
- SEE OR SEARCH CLASS:  
194, Check-Actuated Control Mechanisms, appropriate subclasses for a coin controlled device of general utility.  
380, Cryptography, appropriate subclasses for signal scrambling and subclasses 252 through 254 for encryption by signal masking.
- 39 TRANSMITTER AND RECEIVER AT SEPARATE STATIONS:**  
This subclass is indented under the class definition. Subject matter including at least one transmitting device which converts analog information signals (e.g., audio) into modulated carrier wave signals, a carrier wave transmission medium, and at least one receiving device whereby the information or modulating signal transmitted will be derived from the received modulated carrier wave signals.

- (1) Note. A system, in order to be classified in this subclass and its indents must include a means whereby the information transmitted is transmitted by means of a sinusoidal electromagnetic carrier wave. Systems wherein the intelligence to be conveyed is transmitted by dot and dash (i.e., presence or absence of a unidirectional or direct current wave) are found elsewhere. Systems wherein the intelligence conveyed is pulse or digital information are found elsewhere. Systems wherein the intelligence to be conveyed by a varying current without a carrier wave are found elsewhere. Systems which are properly classifiable, as a result of some significantly claimed art limitations, in another class will not be classified here.
- (2) Note. The subject matter classifiable here will generally comprise both the means for origination and modulating a carrier wave according to the information, desired to be transmitted, and a means for receiving the modulated carrier wave and deriving the desired information. However, where the claimed subject matter includes claims reciting the specific details of a transmitter or receiver or transceiver and broadly include another receiver, transceiver, or transmitter of different type by name only, the patent will be classified here and cross-reference down to the appropriate subclass below which contains the particular transmitter, transceiver, or receiver claimed.
- (3) Note. The systems in this and the indented subclasses comprises at least one transmitter and receiver device which devices are located at an appreciable distance one from the other. However, patents in which the claimed subject matter includes transmitter-receiver means at a single station (transceiver) are also to be found here providing sufficient structure is recited whereby the transmitter-receiver means cooperates with and influence or is influenced by a further receiver or transmitter at a distance; providing, that the claimed

subject matter does not include a structure limiting the system to use of radiant energy as defined in the definition of Class 343 or to use in some other art class device.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 7+, for transmitter-receiver repeater systems.
- 73+, for complete stations wherein the transmitter and receiver are at the same point.
- 91+, for transmitter, per se.
- 130+, for receivers, per se.
- 600+, for light wave communications.

SEE OR SEARCH CLASS:

- 178, Telegraphy, subclasses 2+ for various telegraph systems which are limited to the transmission and reception of telegraph signals; subclasses 24+ for teleprinting systems; subclasses 45+ for loaded carrier wave transmission lines; and subclass 118 for miscellaneous telegraph receivers.
- 244, Aeronautics, particularly subclasses 175+ for systems for automatically controlling aircraft by means of electrical apparatus which may utilize modulated carrier waves for control.
- 246, Railway Switches and Signals, particularly subclasses 7+ and 28+ for carrier wave systems employed in railway signalling.
- 307, Electrical Transmission or Interconnection Systems, subclass 117 for switching systems controlled by radiant energy; and subclass 129 for frequency responsive switching space discharge device or lamp systems.
- 315, Electric Lamp and Discharge Devices: Systems, subclasses 149+ for radiant energy controlled space discharge device or lamp systems.
- 318, Electricity: Motive Power Systems, subclass 16 for electric motor systems where the motor is controlled or supplied by space transmitted electromagnetic or electrostatic energy (including radio energy).
- 324, Electricity: Measuring and Testing, appropriate subclasses for systems for measuring or utilizing carrier waves.

- 327, Miscellaneous Active Electrical Non-linear Devices, Circuits, and Systems, appropriate subclasses for miscellaneous circuits which may constitute elements of a system such as those classifiable in this class.
- 333, Wave Transmission Lines and Networks, appropriate subclasses for passive carrier wave transmission lines which may include passive network elements, attenuators or resonators which may have utility in the carrier wave systems of this class.
- 340, Communications: Electrical, appropriate subclasses for electrical signaling systems, especially subclass 825.71 for selective signaling systems utilizing carrier waves; subclasses 286.01-286.14 for miscellaneous signaling systems consisting of transmitters and receivers; subclasses 539.1-539.32 for systems automatically responsive to a condition and wherein the signal is transmitted via radio levels; and subclasses 870.01-870.44 for telemetering systems.
- 341, Coded Data Generation or Conversion, appropriate subclasses for code converters and subclasses 173 through 192 for code generator or transmitter.
- 346, Recorders, subclass 37 for systems wherein a recorder is operated in response to the tuning of a radio receiver or receivers, e.g., community radio listening survey.
- 369, Dynamic Information Storage or Retrieval, subclasses 6+ for combined radio and phonograph systems.
- 370, Multiplex Communications, for analog carrier wave communication systems which have multiplexing.
- 375, Pulse or Digital Communications, for systems conveying or digital pulse information which may use modulated carrier waves.
- 380, Cryptography, for cryptographic communications.
- 411, Expanded, Threaded, Driven, Headed, Tool-Deformed, or Lock-Threaded Fastener, subclasses 50+ for code converters wherein a transmitter may receive its information in the form of a first code and transmit the information in the form of a dissimilar code; and subclasses 20+ and 173+ for code transmitters.
- 40 Earth or water medium:**  
This subclass is indented under subclass 39. Subject matter where the ground (or water) supplies the natural medium for the transmission of the modulated carrier wave between the transmitter and receiver.
- (1) Note. The subject matter of this subclass has a specific under ground (or underwater) structure at each station.
- SEE OR SEARCH CLASS:  
343, Communications: Radio Wave Antennas, subclass 719 for antenna systems buried underground or submerged underwater.  
375, Pulse or Digital Communications, subclass 218 for pulse communication via an earth or water medium.
- 41.1 Near field (i.e., inductive or capacitive coupling):**  
This subclass is indented under subclass 39. Subject matter including a limited range system where signal transfer from the transmitter to the receiver is inductive or capacitive.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
40, for underwater systems that may be inductive or capacitive.  
41.2, for short range RF communication.
- SEE OR SEARCH CLASS:  
178, Telegraphy, subclass 43 for inductive telegraphy.  
375, Pulse or Digital Communications, subclass 256 for near field pulse or digital communication.
- 41.2 Short range RF communication:**  
This subclass is indented under subclass 39. Subject matter wherein communication between transmitter and receiver is directly implemented via radio frequency signal transmission over a short, limited distance.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

41.1, for near field inductive or capacitive coupling.

**41.3 To output device:**

This subclass is indented under subclass 41.2. Subject matter including signal transfer from the transmitter to a remote output device.

(1) Note. Remote output devices may be audio speakers, printers, etc.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

66.1, for separate transmitter and receiver with diverse art device.

**42 Frequency or phase modulation:**

This subclass is indented under subclass 39. Subject matter in which the intelligence or information to be transmitted is applied to a sine wave carrier in such a manner that the instantaneous frequency and/or phase angle of the sine wave carrier is caused to depart from a reference value by an amount proportional to the instantaneous amplitude of the modulating (intelligence) signal.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

23, for frequency or phase modulated repeater.

29, for secret systems with carrier wobbling.

SEE OR SEARCH CLASS:

340, Communications: Electrical, subclasses 207+ for telemetering systems utilizing frequency or phase modulation.

343, Communications: Radio Wave Antennas, subclass 14 for reflected wave systems utilizing pulse waves frequency or phase modulated; subclass 17.5 for reflected wave systems in general utilizing frequency or phase modulation; and subclasses 100+ for directive systems restricted to radio wave energy and utilizing frequency modulation.

359, Optical: Systems and Elements, various subclasses for optical communication.

375, Pulse or Digital Communications, subclasses 130 through 153 for spread spectrum; and subclasses 223, 271, 302+, 329+, and 334+ for pulse communication by frequency or phase modulation of a carrier wave.

380, Cryptography, particularly subclass 322 for carrier wobbling by cryptographic equipment.

**43 With modification of frequencies of analog signal passed (e.g., pre-emphasis or de-emphasis):**

This subclass is indented under subclass 42. Subject matter where the information or modulating signal is predistorted and/or preamplified prior to its modulation of the carrier wave.

SEE OR SEARCH CLASS:

332, Modulators, subclasses 123+ for frequency modulators, per se, with distortion introduction or control, e.g., pre-emphasis networks.

333, Wave Transmission Lines and Networks, subclasses 28+ for passive equalizing networks, per se.

**44 With stated modulation index:**

This subclass is indented under subclass 42. Subject matter in which the effective frequency excursion or deviation is specified.

**45 Via subcarrier:**

This subclass is indented under subclass 42. Subject matter where an intermediate frequency wave is modulated by a modulating signal representative of an intelligence or message and in turn is applied as a modulation signal to a main carrier wave, either alone or in conjunction with other subcarriers.

(1) Note. The frequency of the subcarrier is usually low relative to that of the main carrier.

**46 Suppressed carrier wave system:**

This subclass is indented under subclass 39. Subject matter where the carrier component of a modulated wave is suppressed at the transmitter so that only the information bearing

sideband or sidebands are transmitted and received.

- (1) Note. Double or single sideband, suppressed carrier systems are found here.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 109, for suppressed carrier transmitter.  
202, for suppressed carrier receivers.

SEE OR SEARCH CLASS:

- 332, Modulators, subclasses 167+ for a suppressed carrier double sideband type amplitude modulator, per se.

**47 Single or vestigial sideband system:**

This subclass is indented under subclass 39. Subject matter where one sideband of the transmitted signal is largely or entirely suppressed while the second sideband has little or no suppression.

- (1) Note. The carrier is not suppressed.  
(2) Note. In this class, the term asymmetric sideband is generic to single and vestigial sideband.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 46, for systems where the carrier is suppressed.  
109, for amplitude modulated transmitters.  
203, for single sideband receivers.  
204, for vestigial sideband receivers.

SEE OR SEARCH CLASS:

- 332, Modulators, subclasses 170+ for a single or vestigial sideband type amplitude modulator, per se.  
348, Television, for vestigial sideband systems particular to television.  
375, Pulse or Digital Communications, subclass 270 for similar systems for transmitting pulse data.

**48 Inverted sideband:**

This subclass is indented under subclass 39. Subject matter where one of the sidebands is shifted by 180 degrees with respect to its normal phase relationship with respect to the other sideband.

**59 Single message via plural carrier wave transmission:**

This subclass is indented under subclass 39. Subject matter where a single message or intelligence is transmitted by means of a plurality of carrier waves.

- (1) Note. The subject matter to be found here will include systems in which the whole intelligence signal is divided into component parts, each of the components being modulated upon a separate carrier wave or systems in which the whole undivided intelligence signal is separately modulated upon separate carrier waves.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 13.1+, and 17, for repeaters utilizing plural channels.  
27, for secret systems using a plurality of carrier waves.  
42, for plural channel angle modulation systems.

SEE OR SEARCH CLASS:

- 178, Telegraphy, subclass 32 for secret telegraph systems which may employ a plurality of carrier waves or alternating current waves.  
375, Pulse or Digital Communications, subclasses 260+ for pulse modulated carrier wave systems using plural channels to transmit a single pulse train.  
380, Cryptography, particularly subclass 34 for a cryptographic system utilizing plural carrier frequencies.

**60 Different phases of same frequency carrier:**

This subclass is indented under subclass 59. Subject matter in which the message is modulated onto different phases (e.g., different polarizations) of a carrier wave and each phase is then separately transmitted.

**61 Single message via plural modulation of single carrier:**

This subclass is indented under subclass 39. Subject matter including modulation of a single carrier wave by a plurality of separate and dis-

tinct modulation signals each representing a portion of the intelligence to be transmitted.

SEE OR SEARCH THIS CLASS, SUBCLASS:

22, for repeaters with plural conversion stages.

28, for plural modulation of a single carrier wave for secrecy.

SEE OR SEARCH CLASS:

375, Pulse or Digital Communications, subclass 269 for pulse modulated carrier wave systems with plural modulation of a single carrier.

380, Cryptography, particularly subclasses 31+ for a cryptographic system utilizing plural modulation of a single carrier wave.

## 62 Optimum frequency selection:

This subclass is indented under subclass 39. Subject matter in which a frequency of operation is selected with is optimum with respect to a given criteria.

## 63.1 Distortion, noise, or other interference prevention, reduction, or compensation:

This subclass is indented under subclass 39. Subject matter with provision for reduction, compensation or elimination of an unwanted signal.

SEE OR SEARCH THIS CLASS, SUBCLASS:

8, for failure compensation in a repeater.  
10, for fading compensation in repeaters.  
78 through 83, for transceivers with transmitter receiver interaction prevention.

119, for transmitters with carrier frequency stabilization.

134, and 135, for plural receivers with output selecting according to signal strength or quality.

222 through 224, for noise controlled squelch in a receiver.

234.1 through 253.2, for automatic gain or volume control in a receiver.

255 through 265, for local oscillator frequency control in a receiver.

267, for tone control in a receiver.

268, for fidelity control in a receiver.

278.1 through 279.1, for receiver plural wave collector noise or interference elimination.

283 through 288, for receiver wave collector interference or noise elimination.

296 through 312, for receiver noise or interference elimination.

501 through 506, for similar subject matter in plural transmitter/receiver systems.

701 through 703, for tone coded squelch.

## 63.2 System with hierarchical coverage areas:

This subclass is indented under subclass 63.1. Subject matter including interference prevention, reduction, or compensation in an hierarchical communication system which has multiple structural communication levels (e.g., overlaid coverage areas, smaller coverage areas overlapped by larger coverage areas).

SEE OR SEARCH THIS CLASS, SUBCLASS:

450, and 509, for channel allocation.

## 63.3 Frequency switching:

This subclass is indented under subclass 63.1. Subject matter including selecting between frequencies or channels to prevent interference.

## 63.4 Directional antenna:

This subclass is indented under subclass 63.1. Subject matter in which a focus beam is provided in a desired direction of transmission or reception.

SEE OR SEARCH THIS CLASS, SUBCLASS:

25, for an antenna which is more responsive in one direction than another in a repeater system.

SEE OR SEARCH CLASS:

342, Communications: Directive Radio Wave Systems and Devices (e.g., Radar, and Radio Navigation), subclasses 359 and 367 for directive system antenna orientation or a directive communication system in general, respectively.

## 64 Plasma source or barrier:

This subclass is indented under subclass 63.1. Subject matter where the distortion and noise

- is caused by a plasma (e.g., space craft re-entry).
- 65 Anti-multipath:**  
This subclass is indented under subclass 63.1. Subject matter where there is prevention, reduction, or compensation for distortion caused by the modulated carrier wave traveling from the transmitter to the receiver by plural paths of differing lengths.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
10, for fading compensation in a repeater.  
504+, for fading compensation in a plural transmitter or receiver systems.
- 66.1 Having diverse art device:**  
This subclass is indented under subclass 39. Subject matter including a separated transmitter and receiver system along with another art device or structure having an added purpose or independent utility other than to perfect an element of the system and in which the utility of the other art device or structure is not destroyed or disturbed by its removal from the system.
- (1) Note. Combination with specific art having subclass provided for in other class is classified in the other class. See search class note below.
- SEE OR SEARCH CLASS:  
40, Card, Picture, or Sign Exhibiting, subclasses 455 through 457 for changeable exhibitors with sound in which the source of the sound may be a radio receiver.  
102, Ammunition and Explosive, subclass 214 for fuses utilizing a radio wave.  
116, Signals and Indicators, subclasses 241 through 263 for position indicators for radio apparatus.  
178, Telegraphy, subclasses 118 through 120 for telegraph receivers which may be combined with other art devices.  
194, Check-Actuated Control Mechanisms, appropriate subclasses for a check controlled radio apparatus combined with other art device.  
248, Supports, subclass 27.1 for means for supporting an instrument in a panel.
- 307, Electrical Transmission or Interconnection Systems, subclasses 9.1 through 10.8 for vehicle mounted systems in which the vehicle may provide power means for a radio telephone or other receiver means and subclasses 154-157 for miscellaneous systems with particular load device or load device combination.  
312, Supports: Cabinet Structure, subclass 7.1 for radio type cabinets.  
340, Communications: Electrical, subclass 539 for a condition responsive indicating system with a radio coupling link.  
343, Communications: Radio Wave Antennas, subclass 6 for reflected wave (e.g., radar) systems combined with diverse type radiant energy systems.  
346, Recorders, subclass 25 for recorders combined with other nonrecording devices; and subclass 37 for recorders combined with a radio receiver and tuning responsive and for the purpose of determining the listening habits of the users of a receiver.  
362, Illumination, appropriate subclasses for combined light and other art device structure.  
368, Horology: Time Measuring Systems or Devices, subclasses 10 through 14 for clocks combined with other devices where the claimed combination does not include characteristics of the device not necessary to the function of the horological device.  
369, Dynamic Information Storage or Retrieval, subclasses 6 through 12 for combined radio and phonograph systems.  
386, Television Signal Processing for Dynamic Recording or Reproducing, appropriate subclasses for television combined with recorders  
396, Photography, subclass 434 for a camera combined with a radio.  
446, Amusement Devices: Toys, subclasses 297 through 303 for a figure toy having a sounder, wherein the figure may act as a receptacle for a receiver.

**67.7 With indication (e.g., visual or voice signaling, etc.):**

This subclass is indented under subclass 67.1. Subject matter having means for making a condition pertaining to the testing or measuring of the system perceptible to a human operator.

**SEE OR SEARCH CLASS:**

340, Communications: Electrical, subclasses 539.1 through 539.32 for generic condition indicating system over radio link.

**67.11 Having measuring, testing, or monitoring of system or part:**

This subclass is indented under subclass 39. Subject matter which relates to means intended solely for the purpose of and adapted to (a) adjust the frequency setting of a carrier wave generation means or determine the output frequency or some other characteristics of a transmitter means; (b) adjust the frequency setting of a local oscillator, a tuning means or other stages of a receiver means in accordance with a standard frequency; c) compare the frequency of a resonant input or output circuit of a receiver or transmitter with a standard frequency for the purpose of setting a tuning position indicator or dial to correspond to maximum transmitter or receiver output at the standard frequency; and (d) determine the operating characteristics of the whole or selected components of the system under prescribed conditions of operation.

**67.12 Using a chamber (e.g., room testing or audio surveillance, etc.):**

This subclass is indented under subclass 67.11. Subject matter wherein the measuring, testing, or monitoring is conducted in a confined housing or in a relatively close location.

- (1) Note. For example, method or device for locating an inter-modular or interference source in a close proximity to a desired transmitting source, or detecting the presence of a hidden transmitter, e.g., eavesdropping device.

**67.13 Noise, distortion, or unwanted signal detection (e.g. quality control etc.):**

This subclass is indented under subclass 67.11. Subject matter having means to detect any

undesired electrical disturbance within the useful frequency band arising from sources internal or external to the system (e.g., cross-talk, power induction, atmospheric noise, etc.), or any undesired self-sustained oscillation existing in the system, or other unwanted signals tending to interfere with the operation of the system.

**67.14 Using a test signal:**

This subclass is indented under subclass 67.11. Subject matter wherein a signal of predetermined frequency (i.e., reference signal) is sent over the system for testing or measuring purposes (e.g., emulation, loop-back, etc.).

**67.15 Of a microwave link or system:**

This subclass is indented under subclass 67.11. Subject matter involves system using communication signals in the range of microwave frequencies (i.e., approximately 1000 MHZ and above).

**67.16 Phase measuring (e.g., group delay, propagation effect, etc.):**

This subclass is indented under subclass 67.11. Subject matter including means to measure the change in phase of propagating waves.

- (1) Note. Phase measurement may be used for developing a suitable control for equalization, attenuation compensation, synchronization, etc.

**68 With control signal:**

This subclass is indented under subclass 39. Subject matter wherein the communication apparatus includes an intelligence signal transmitted from a transmitter to a receiver over distances large compared with their dimensions and where one of either the transmitter or receiver includes controlling means which causes some modification of the operation of the other.

**69 Transmitter controlled by signal feedback from receiver:**

This subclass is indented under subclass 68. Subject matter wherein the controlling means is located at the receiver and modifies the operation of the transmitter in response thereto.

**70 Receiver control signal originates at message transmitter:**

This subclass is indented under subclass 68. Subject matter wherein the controlling means is located at the transmitter and modifies the operation of the receiver in response to said controlling means.

- (1) Note. The controlling means may send a reference or controlling modulation component on the carrier wave. However, such component must be distinct from the message, as receivers responsive to the inherent characteristics of the message signal are excluded from this subclass.

**71 Frequency control:**

This subclass is indented under subclass 70. Subject matter where the frequency to which the receiver is tuned is controlled.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 151.1, for remote control of channel or station selection in a receiver.

**72 For compression and expansion of message signal (i.e., companding):**

This subclass is indented under subclass 70. Subject matter wherein the range of variation of the modulating parameter is decreased at the transmitter and expanded in the complementary manner in the receiver.

SEE OR SEARCH CLASS:

- 333, Wave Transmission Lines and Networks, subclass 14 for companding systems, per se.

**73 TRANSMITTER AND RECEIVER AT SAME STATION (E.G., TRANSCEIVER):**

This subclass is indented under the class definition. Subject matter having both a signal transmitter and a signal receiver at a common geographic location for transmission and reception of separate signals.

- (1) Note. The transmitter and receiver at a common location are hereafter termed "a station" in these definitions.

- (2) Note. The simultaneous separation of a transmitter and receiver is a duplex operation and is classified in Class 370, Multiplex Communications, subclasses 276+.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 1, for an interference signal transmitter, which may include a receiver at the same station.  
606+, for a complete light wave communication station.

SEE OR SEARCH CLASS:

- 370, Multiplex Communications, subclasses 276+ for duplex systems, see (2) Note above.  
375, Pulse or Digital Communications, subclass 219 for similar devices which handle pulse and digital signals.

**74 Convertible (e.g., to diverse art device):**

This subclass is indented under subclass 73. Subject matter wherein at least a portion of the transceiver circuitry is alternatively operable as a portion of another electrical sound signal processing system.

- (1) Note. The term convertible is intended to include a receiver for a different frequency band (e.g., broadcast receiver).

**74.1 Cordless/corded conversion:**

This subclass is indented under subclass 74. Subject matter wherein the transceiver includes a structure for transforming a wired transmission capability to a wireless transmission capacity or vice versa.

**75 With frequency stabilization (e.g., automatic frequency control):**

This subclass is indented under subclass 73. Subject matter having means to prevent or compensate for variation in the operating frequency of the transceiver.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 113, and 119, for transmitter with automatic frequency control or stabilization.

- 164.1, 173.1, 192.1+, and 257, for receivers with automatic frequency control or stabilization.
- SEE OR SEARCH CLASS:  
331, Oscillators, subclasses 1+ for oscillators with automatic frequency control.
- 76 Synthesizer:**  
This subclass is indented under subclass 75. Subject matter in which a single stable oscillator is used as a source of one or more frequencies derived therefrom by frequency multiplication or division.
- (1) Note. The stable oscillator is often crystal controlled or phase-locked.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
165.1, and 183.1+, for receivers with synthesizers.
- SEE OR SEARCH CLASS:  
331, Oscillators, subclass 1 for synthesizers in general.
- 77 With tuning:**  
This subclass is indented under subclass 73. Subject matter having means to control or adjust the frequency of the transmitted or received signal; or the loading or adjustment of the radio frequency circuits is varied.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
120+, for transmitter tuning.  
150.1, for receiver tuning.
- SEE OR SEARCH CLASS:  
334, Tuners, for passive tuning circuits in general.
- 78 With transmitter-receiver switching or interaction prevention:**  
This subclass is indented under subclass 73. Subject matter wherein the transmitter and receiver are made orthogonal by alternatively actuating the transmitter or receiver or by isolation circuitry.
- SEE OR SEARCH CLASS:  
370, Multiplex Communications, subclasses 278 and 282+ for transmit/receive interaction control in duplex communications.
- 79 Automatic (e.g., voice-operated):**  
This subclass is indented under subclass 78. Subject matter wherein the switching device is other than manually operated.
- (1) Note. Such means includes voice operated switching.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
116, for transmitters automatically actuated in response to voice, etc.
- 80 With distributed parameter coupling:**  
This subclass is indented under subclass 79. Subject matter having a distributed parameter transmitter line coupling the transmitter and receiver portions of the transceiver to an antenna.
- SEE OR SEARCH CLASS:  
333, Wave Transmission Lines and Networks, subclasses 100+ for branched circuits.
- 81 Waveguide:**  
This subclass is indented under subclass 80. Subject matter wherein the transmission line is a hollow conductor.
- SEE OR SEARCH CLASS:  
327, Miscellaneous Active Electrical Non-linear Devices, Circuits, and Systems, subclass 593 for miscellaneous circuits with a distributed parameter element (e.g., waveguide).  
333, Wave Transmission Lines and Networks, subclass 13 for waveguides having gas breakdown switching (e.g., T-R) tubes; subclasses 100+ for branching networks; and subclass 13 for hybrid transmit-receiver isolators.
- 82 Common antenna:**  
This subclass is indented under subclass 79. Subject matter where the transmitter and the receiver use the same antenna.

**83 Single antenna switched between transmitter and receiver:**

This subclass is indented under subclass 78. Subject matter which has a single antenna which is alternately connected to the transmitter and receiver.

SEE OR SEARCH THIS CLASS, SUBCLASS:

82, for a single antenna automatically switched between transmitter and receiver.

**84 With a common signal processing stage:**

This subclass is indented under subclass 73. Subject matter having an active element which performs a signal processing or generating function in the transmitter portion of the apparatus during signal transmission and in the receiver portion of the apparatus during signal reception.

(1) Note. The terms "active" and "signal processing" are used to exclude common use of nonprocessing elements, e.g., antennas and power supplies.

**85 Transmitter oscillator used as detector:**

This subclass is indented under subclass 84. Subject matter wherein the active element circuitry which produces the carrier signal during transmission functions as a demodulator during signal reception.

(1) Note. The term demodulator used above excludes heterodyning mixers. Rather it includes only those devices producing a signal which is a replica of the original modulating information signal.

**86 Transmitter oscillator used as local oscillator:**

This subclass is indented under subclass 84. Subject matter wherein the active element circuitry which produces the carrier during transmission also produces the oscillatory signal with which the received signal is heterodyned.

**87 Tunable or variable:**

This subclass is indented under subclass 86. Subject matter where the frequency of the local oscillator is variable or changeable.

**88 Transceiver controlling a separate transceiver or receiver:**

This subclass is indented under subclass 73. Subject matter wherein the transceiver is operative to produce a signal controlling the operation of another transceiver or a receiver at the same location.

(1) Note. The controlling signal may be either a signal produced for control purposes or may be the normal transmitted signal of the transceiver.

(2) Note. Such control may include, for example, switching from a stand-by condition.

SEE OR SEARCH THIS CLASS, SUBCLASS:

132+, for diversity-type receivers which may control one another.

352, for receivers which are remotely controlled.

SEE OR SEARCH CLASS:

340, Communications: Electrical, subclasses 825 through 825.98 for various remote control systems not limited to modulated carrier waves and selective paging systems.

**90.1 Having particular application (e.g., avalanche victim assistance) of a transceiver:**

This subclass is indented under subclass 73. Subject matter wherein a transceiver other than a radiotelephone is designed for or utilized in a specific environment.

**90.2 Having particular configuration (e.g., C.B. or walkie-talkie) of a transceiver:**

This subclass is indented under subclass 73. Subject matter wherein a transceiver other than a radiotelephone has a particular arrangement of its component parts.

(1) Note. This includes, for example, such configurations as citizen band (CB) radio, walkie-talkie, Smart Mobile Radio (SMR), or Push To Talk (PTT).

**90.3 Having particular housing or support of a transceiver:**

This subclass is indented under subclass 73. Subject matter wherein a transceiver other than a radiotelephone has a specified enclosure or support means.

SEE OR SEARCH THIS CLASS, SUBCLASS:

347, for a receiver housing.

SEE OR SEARCH CLASS:

248, Supports, subclasses 309.1 through 316.8 for bracket means for holding a radio that does not claim radio structure.

312, Supports: Cabinet Structure, subclass 7.1 for radio cabinets, per se, that do not claim radio structure.

**91 TRANSMITTER:**

This subclass is indented under the class definition. Subject matter comprising apparatus for generating and modulating a carrier wave and usually including the coupling of the modulated carrier wave to the transmission medium.

SEE OR SEARCH THIS CLASS, SUBCLASS:

1, for an interference signal transmitter.  
7+, for a repeater or relay system having a transmitter stage.  
26+, for a secret system transmitter.  
39+, for systems having a transmitter and a receiver.  
88+, for a transceiver.

SEE OR SEARCH CLASS:

178, Telegraphy, subclasses 79+ for telephone transmitters.

219, Electric Heating, subclasses 600+ for inductive heating, subclasses 678+ for microwave heating, and subclasses 764+ for capacitive dielectric heating.

250, Radiant Energy, appropriate subclasses for radiant energy transmitters in general.

310, Electrical Generator or Motor Structure, appropriate subclasses for electrical generators.

315, Electric Lamp and Discharge Devices: Systems, subclass 34 for a particular electron discharge tube

device in a circuit including an antenna.

322, Electricity: Single Generator Systems, appropriate subclasses for generating electricity.

331, Oscillators, appropriate subclasses.

332, Modulators, appropriate subclasses for modulators, per se.

340, Communications: Electrical, appropriate subclasses for traffic and vehicle communications; subclass 311.2 for nonselective paging transmitters; subclasses 539.1-539.32 for alarms with a radio link; subclasses 825-825.98 for selective (e.g., remote control), including subclasses 7.1-7.63 for selective paging transmitters; subclasses 853.1-856.4 for well bore communications; and subclasses 870.18-870.24 for telemetering, all which may include modulated carrier waves.

343, Communications: Radio Wave Antennas, subclasses 5+ for reflected or returned wave systems; and subclasses 100+ for antennas which may nominally recite a transmitter.

348, Television, subclasses 469+ and 723+ for television transmitters.

375, Pulse or Digital Communications, particularly subclasses 295+ for similar transmission of pulse or digital signals.

380, Cryptography, appropriate subclasses for a cryptographic telecommunication system.

**92 Remote control of a transmitter:**

This subclass is indented under subclass 91. Subject matter including structure for modifying or controlling the operation of the transmitter from a point removed some distance from the transmitter.

(1) Note. The controlling function may be performed automatically or manually.

SEE OR SEARCH THIS CLASS, SUBCLASS:

352, for remote control of a receiver.

## SEE OR SEARCH CLASS:

340, Communications: Electrical, subclasses 825.69 and 825.72 for radio remote control in selective signalling systems.

**93 Convertible to different type (e.g., AM to FM):**

This subclass is indented under subclass 91. Subject matter wherein the transmitter is constructed so that it may be changed from one type of transmitter to a different type of transmitter, such as, for example, changed from a crystal controlled to a tunable transmitter or change from FM to AM.

- (1) Note. If one alternative is pulse, e.g., digital transmission, the system is classified in Class 375.

## SEE OR SEARCH CLASS:

375, Pulse or Digital Communications, subclass 216 for transmitters convertible to/from pulse modulated carrier wave.

**94 Alternator:**

This subclass is indented under subclass 91. Subject matter where the transmitter power is generated by a dynamo-electric radio frequency device.

## SEE OR SEARCH CLASS:

178, Telegraphy, subclass 116 for spark gap or arc discharge transmitters.

**95 Mobile or portable:**

This subclass is indented under subclass 91. Subject matter constructed to be transportable by vehicle or person.

- (1) Note. The transmitters in this and the indented subclasses may be installed upon a vehicle and operated while the vehicle is in motion or may be installed or positioned on the vehicle to be ejected therefrom as in the subclass below.
- (2) Note. Transmitters, per se, which send signals which indicate relative direction or position are classified elsewhere.

## SEE OR SEARCH THIS CLASS, SUBCLASS:

11.1, for mobile or portable repeaters.  
90.1 through 90.3, 517, 569.2, and 575.1-575.9, for mobile or portable transceiver.  
96, for transmitter ejected from a mobile vehicle.  
517+, and 575, for mobile or portable systems.

## SEE OR SEARCH CLASS:

340, Communications: Electrical, subclasses 22+ for vehicle or traffic environment signalling; and subclasses 500+ for condition responsive indicating systems.  
343, Communications: Radio Wave Antennas, subclasses 100+ for directive type transmitters or receivers or receivers, per se.

**96 Transmitter ejected from moving vehicle:**

This subclass is indented under subclass 95. Subject matter where the transmitter is ejected from a mobile vehicle.

- (1) Note. The transmitter may be automatically ejected (e.g., responsive to the impact of a crash) or manually ejected by operation of a switch.

## SEE OR SEARCH CLASS:

244, Aeronautics, subclasses 138+ for safety lowering devices in general of the aeronautical type.  
340, Communications: Electrical, subclasses 22+ for vehicle or traffic environment signalling.  
343, Communications: Radio Wave Antennas, subclasses 100+ for sending of radio wave energy which is characterized by relative direction or position and is not ejected or activated by a moving vehicle.

**97 With antenna ejection or external support:**

This subclass is indented under subclass 95. Subject matter including provision for ejecting or extending an antenna from the transmitter, or having provision for externally supporting an antenna (e.g., a balloon).

- (1) Note. The antenna ejection or antenna support may or may not be automatically operated.
- 98 With aircraft, satellite, or projectile:**  
This subclass is indented under subclass 95. Subject matter combined with or carried by an air or space vehicle.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
96, if the transmitter is ejected from the vehicle.
- 99 With vehicle:**  
This subclass is indented under subclass 95. Subject matter carried by or combined with a vehicle such as surface craft, submarine, automobile, or other land or waterborne vehicle.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
98, for transmitters combined with aircraft.
- SEE OR SEARCH CLASS:  
340, Communications: Electrical, subclasses 22+ for vehicle or traffic environment signalling.  
343, Communications: Radio Wave Antennas, subclasses 709 and 710 for waterborne antennas.  
441, Buoys, Rafts, and Aquatic Devices, subclass 89 for body attached buoyant devices combined with analog modulated carrier wave communications.
- 100 Body attached or connected:**  
This subclass is indented under subclass 95. Subject matter which is shaped to fit the body or be supported by the body.
- (1) Note. For classification in this subclass, a portion of the transmitter must be shaped to fit or be supported by the body such as an antenna or microphone attached to the body. Small hand carried transmitters with no portion thereof connected to the body are classified elsewhere in this class.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
95, for small hand carried transmitters with no portion thereof connected to the body.
- SEE OR SEARCH CLASS:  
340, Communications: Electrical, subclasses 573.1+ for transmitters responsive to the condition of a human which may be attached or connected to the body.  
343, Communications: Radio Wave Antennas, subclass 718 for body attached or supported antennas.
- 101 Diversity:**  
This subclass is indented under subclass 91. Subject matter where two or more channels are transmitted via different paths, frequencies, or times of transmission.
- (1) Note. Subject matter classified here is distinguished from multiplex, Class 370, in that no specialized receiver is needed for discerning the separate channels.  
(2) Note. Subject matter classified here is limited to the transmission of a single message at a time over the channels.  
(3) Note. Some system classified here are directed toward reducing fading at the receiver.
- 102 Plural modulation:**  
This subclass is indented under subclass 91. Subject matter in which the carrier wave is modulated at least twice prior to transmission.
- (1) Note. The plural modulation may be of the same or diverse types, and is usually sequential.
- SEE OR SEARCH CLASS:  
332, Modulators, subclasses 119+, 145 and 151+ for plural modulation, per se.
- 103 Plural separate transmitters or channels:**  
This subclass is indented under subclass 91. Subject matter where there are plural transmission channels formed of separate complete transmitters, capable of independent operation.

- (1) Note. The plural transmitters may be interconnected to a common antenna, by a common power supply or by a common control signal path.
- (2) Note. Systems using multiplex techniques to combine separate messages and apply to a common antenna are classified in Class 370, subclasses 339+.
- 104 Carrier and sidebands separately transmitted:**  
This subclass is indented under subclass 103. Subject matter where separate channels are provided for transmitting the carrier and the sideband components of a modulated carrier wave.
- (1) Note. Also included in this subclass are transmitters having separate channels for the carrier and sideband components and with means to produce a rotating field pattern.
- 105 Common frequency:**  
This subclass is indented under subclass 103. Subject matter where the plural transmitters broadcast on the same frequency.
- (1) Note. Systems with frequency control of the second, spaced, or remote, transmitter are classified in subclass 92 above.
- 106 Modulation by absorption, shielding, or reflecting:**  
This subclass is indented under subclass 91. Subject matter including structure spaced from or external to the antenna which modulates the carrier radiated from the antenna, such as by absorption, shielding, or reflecting.
- (1) Note. The radiated carrier may be angle modulated or it may be amplitude modulated.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
121+, and 129+, for systems not limited to modulation systems.
- SEE OR SEARCH CLASS:  
343, Communications: Radio Wave Antennas, subclasses 753+ for radio antennas with external radio wave refractor.
- 107 With variation of antenna impedance or dimension for modulation:**  
This subclass is indented under subclass 91. Subject matter where the carrier wave is modulated, under control of the modulating intelligence signal, by varying the impedance or dimension of the antenna.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
121+, for systems in which the antenna circuit is varied for tuning.  
129+, for systems in which the antenna coupling is explicitly shown and varied therefor.  
269+, for systems of antenna combined with receiver for similar coupling arrangements, noting especially 289.
- 108 Amplitude modulation:**  
This subclass is indented under subclass 91. Subject matter where the amplitude of the carrier is varied under control of the intelligence to be transmitted.
- 109 Vestigial or single sideband or suppressed carrier:**  
This subclass is indented under subclass 108. Subject matter where less than two complete sidebands are transmitted, with or without the carrier or two complete sidebands are transmitted without the carrier.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
46, for suppressed carrier wave systems.  
47, for single or vestigial sideband systems.
- SEE OR SEARCH CLASS:  
332, Modulators, subclasses 167+ for a suppressed carrier double sideband type amplitude modulator.  
348, Television, subclasses 723+ for vestigial sideband television transmitters.

- 110 Angle modulation:**  
This subclass is indented under subclass 91. Subject matter where the frequency or phase of the carrier wave is varied or modulated under control of the intelligence that is transmitted.
- 111 Including distributed parameter structure:**  
This subclass is indented under subclass 110. Subject matter including, as a significant part of the transmitter, a structure with distributed parameter wave transmission means or circuits designed to simulate the impedance characteristics of distributed parameter wave transmission means.
- SEE OR SEARCH CLASS:  
333, Wave Transmission Lines and Networks, appropriate subclasses for distributed electric parameter devices, per se.
- 112 With frequency multiplication or division:**  
This subclass is indented under subclass 110. Subject matter where a signal at one frequency is converted to a second frequency which is a multiple or sub-multiple of the first frequency.
- SEE OR SEARCH CLASS:  
327, Miscellaneous Active Electrical Non-linear Devices, Circuits, and Systems, subclasses 113+ for miscellaneous frequency conversion or control.  
363, Electric Power Conversion Systems, subclasses 157+ for power frequency conversion.
- 113 With frequency control:**  
This subclass is indented under subclass 110. Subject matter where the operating frequency of the transmitter is controlled or regulated.
- 114.1 Having harmonic radiation suppression:**  
This subclass is indented under subclass 91. Subject matter having provision for the reduction or suppression of a sinusoidal wave having a frequency which is an integral multiple of a fundamental frequency at an antenna.
- 114.2 Noise or interference elimination:**  
This subclass is indented under subclass 91. Subject matter having structure to suppress the influence of extraneous electric fields upon transmitter circuitry.
- 114.3 Predistortion (e.g., for power amplifier):**  
This subclass is indented under subclass 114.2. Subject matter where a transmitted signal may prior to transmission, be distorted in a manner complementary to the distortion introduced in the power amplifier, antenna or transmission medium, etc.
- SEE OR SEARCH CLASS:  
375, Pulse or Digital Communications, subclasses 296 through 297 for predistortion techniques in the transmission of pulse or digital signals.
- 115.1 Measuring, testing, or monitoring of transmitter:**  
This subclass is indented under subclass 91. Subject matter having measuring, testing, or monitoring of the signals transmitted.
- (1) Note. The transmitter must be claimed in detail along with the monitoring means, claimed broadly or in detail.
- SEE OR SEARCH CLASS:  
324, Electricity: Measuring and Testing, subclasses 76.11 through 157 for measuring sensing or testing electricity, per se.  
340, Communications: Electrical, subclass 653 for condition of electronic circuit or component responsive indication.
- 115.2 Using a test signal:**  
This subclass is indented under subclass 115.1. Subject matter wherein a signal of predetermined frequency (i.e., reference signal) is involved in the process of testing or measuring.
- 115.3 Signal strength:**  
This subclass is indented under subclass 115.1. Subject matter including a means for measuring a signal intensity level.
- 115.4 Having meter or indicator:**  
This subclass is indented under subclass 115.1. Subject matter including a means for displaying to a human observer information concerning a transmitter characteristic being measured.

**116 Carrier amplitude control (e.g., voice operated on/off):**

This subclass is indented under subclass 91. Subject matter where the amplitude of the carrier signal is controlled responsive to the modulation signal.

- (1) Note. For classification in this subclass the amplitude of the carrier is varied responsive to the modulation signal, for example, the carrier amplitude is reduced or cut off when the modulating signal is absent or reduced.

**117 With electrical protection of transmitter circuit or operator:**

This subclass is indented under subclass 91. Subject matter where the transmitter circuits or operators are protected from damage or injury such as from overload or malfunction of a component within the transmitter.

- (1) Note. For classification in this subclass some detail of the transmitter must be claimed along with the protective means, claimed broadly or in detail, for protecting the operator or transmitter. Where the transmitter is claimed broadly (such as by name only) and the protective means is claimed in detail, classification is with the protective means.
- (2) Note. The overload may be the result of a defective tube or other component within the transmitter or it may be the result of an external fault such as an antenna failure, lightning, or of transmission line arc-over.
- (3) Note. Transmitters with temperature modifier or control means, such, for example, as cooling are in this subclass.
- (4) Note. Transmitters with automatic condition responsive alarm are elsewhere in this class.
- (5) Note. Operator protection is also included here.

SEE OR SEARCH THIS CLASS, SUBCLASS:

115.1 through 115.4, for transmitters with automatic condition responsive alarm.

SEE OR SEARCH CLASS:

- 307, Electrical Transmission or Interconnection Systems, subclasses 326+ for generic personnel safety means.
- 330, Amplifiers, subclass 51 for amplifiers with automatic disabling switch.
- 331, Oscillators, subclass 62 for oscillators with circuit means.
- 361, Electricity: Electrical Systems and Devices, subclasses 1+ for safety and protection of electrical systems and devices.

**118 Frequency conversion:**

This subclass is indented under subclass 91. Subject matter where a signal is converted from a first frequency to a second frequency.

SEE OR SEARCH CLASS:

- 327, Miscellaneous Active Electrical Non-linear Devices, Circuits, and Systems, subclasses 113+ for miscellaneous frequency conversion or control.
- 331, Oscillators, subclasses 51 and 53 for plural oscillator frequency multipliers and dividers.
- 363, Electric Power Conversion Systems, subclasses 157+ for electric power frequency conversion.

**119 Carrier frequency stabilization:**

This subclass is indented under subclass 91. Subject matter including provision to prevent or compensate for undesirable drift or change in the frequency at which the transmitter is operating.

- (1) Note. The prevention or compensation for the drift or change in frequency of the transmitter may be automatically controlled.

**120 Including tuning:**

This subclass is indented under subclass 91. Subject matter including a resonant network or crystal whose resonant frequency may be varied (tuned) to control or modify the operating frequency of the transmitter, or which may be

- substituted for other resonant networks or crystals, as by switching, to control or modify the operating frequency of the transmitter.
- 121 In antenna circuit:**  
This subclass is indented under subclass 120. Subject matter wherein the tuning structure or circuitry is located within the antenna or forms part of the antenna coupling circuit.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
129, for a transmitter with an antenna circuit with variable coupling thereto.
- 122 With saturable reactor:**  
This subclass is indented under subclass 121. Subject matter having a magnetic core reactor which is controlled by adjusting a superimposed unidirectional magnetic flux to effect adjustment of saturation of the core.
- SEE OR SEARCH CLASS:  
307, Electrical Transmission or Interconnection Systems, subclasses 401+ for saturable reactor systems, in general.
- 123 Automatically controlled:**  
This subclass is indented under subclass 121. Subject matter wherein the tuning is controlled in response to a signal condition.
- 124 Distributed parameter device:**  
This subclass is indented under subclass 120. Subject matter where the tuning structure includes, as a significant part thereof, structure with distributed parameter wave transmission circuits or circuits designed to simulate the impedance characteristics of distributed parameter wave transmission circuits.
- SEE OR SEARCH CLASS:  
333, Wave Transmission Lines and Networks, appropriate subclasses.
- 125 Automatic adjustment of tuning:**  
This subclass is indented under subclass 120. Subject matter where the variation or substitution is in response to a characteristic of the transmitter or transmitted signal.
- 126 With feedback of modulated output signal:**  
This subclass is indented under subclass 91. Subject matter including provision to apply a portion of the output signal of the transmitter to the input of a prior stage.
- (1) Note. The feedback circuit may include an auxiliary pickup coil or antenna to collect a portion of the energy being transmitted.
- (2) Note. The signal feedback may be shifted in phase to compensate for hum or distortion.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
69, for a system having a transmitter and receiver at separate stations in which the transmitter is controlled by signal feedback from the receiver.
- 127.1 Power control, power supply, or bias voltage supply:**  
This subclass is indented under subclass 91. Subject matter including control detail of transmitter power output (e.g., via power amplifiers), or detail of the source of electrical energy, or of the circuitry connecting such source to the transmitter for supplying power, or biasing potential to the active elements of the transmitter.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
117, for power or bias control for transmitter circuit or operator protection.  
343, for power or bias voltage supply in receivers.  
572, for power supply in transceiver.
- 127.2 Gain control:**  
This subclass is indented under subclass 127.1. Subject matter including detail of controlling the gain of an active element (such as power amplifier) of the transmitter.
- SEE OR SEARCH CLASS:  
330, Amplifiers, subclass 278 for gain control means.

**127.3 Plural amplifier stages:**

This subclass is indented under subclass 127.2. Subject matter including detail of controlling the gains of plural amplifier stages of the transmitter.

## SEE OR SEARCH CLASS:

330, Amplifiers, appropriate subclasses for amplifiers, per se.

**127.4 Dual mode (e.g., analog and digital):**

This subclass is indented under subclass 127.1. Subject matter including detail of a transmitter operable in either of two modes.

## SEE OR SEARCH THIS CLASS, SUBCLASS:

553.1, for dual mode radiotelephone using more than one transceiver (e.g., for analog and digital, trunking and cellular, etc.).

**127.5 Power conservation:**

This subclass is indented under subclass 127.1. Subject matter including detail of reducing power consumption in a transmitter.

## SEE OR SEARCH THIS CLASS, SUBCLASS:

574, for power conservation in transceiver.

## SEE OR SEARCH CLASS:

340, Communications: Electrical, subclass 7.32 for battery saving in code responsive receiver (such as pager).  
713, Electrical Computers and Digital Processing Systems: Support, subclasses 320 through 324 for computer power conservation.

**128 With casing or housing:**

This subclass is indented under subclass 91. Subject matter provided with a casing or housing for enclosing the transmitter or a portion of the transmitter.

- (1) Note. For classification in this subclass, some detail of the transmitter must be claimed along with the casing or housing.

## SEE OR SEARCH CLASS:

174, Electricity: Conductors and Insulators, subclasses 50 through 565 for electrical equipment boxes and housings, in general.  
220, Receptacles, appropriate subclasses.  
312, Supports: Cabinet Structure, subclass 7.1 for radio cabinets, per se.  
331, Oscillators, subclasses 67 through 69 for oscillators with shielding, casings, or housings.  
361, Electricity: Electrical Systems and Devices, subclasses 331+ for housings and mounting assemblies with plural diverse electrical components.

**129 With coupled antenna:**

This subclass is indented under subclass 91. Subject matter including an antenna and circuit for coupling the antenna to the active elements of the transmitter.

- (1) Note. For classification here, some transmitter details should be included in the claimed combination. Combinations of antenna, coupling, and nominal transmitter are classified in Class 343, Communications: Radio Wave, subclasses 850+. See also (4) Note under subclass 850 of Class 343.

## SEE OR SEARCH THIS CLASS, SUBCLASS:

114.1 through 114.3, for coupling systems restricted or related to suppression of harmonics.

**130 RECEIVER OR ANALOG MODULATED SIGNAL FREQUENCY CONVERTER:**

This subclass is indented under the class definition. Apparatus comprising (a) means for receiving a carrier wave, upon which an information signal has been modulated, and deriving the original information signal from the modulated carrier wave. Further means may be provided for converting the derived signal into a physical manifestation readily perceived by at least one of the human senses (e.g., sound) or (b) devices whereby an incoming carrier wave signal, which has been modulated by an analog signal, is changed from one carrier frequency to another carrier frequency.

- (1) Note. The system and apparatus found in this and the indented subclasses under (1) above will include wave collection means, at least one wave mixing or modifying means, detector, or demodulator means and utilization means, which utilization means may consist of a sound reproducing device. This class also contains subcombinations of any of the above recited elements combined with coupling circuitry, whereby some function of a complete receiver system is performed; as for example, antenna means broadly plus detector, radio frequency amplifier plus mixer means, etc., and which subcombinations are not elsewhere classifiable.
- (2) Note. The apparatus found in this and the indented subclasses will be restricted to those systems which are limited, by claimed subject matter, to use in the reception and utilization of electromagnetic wave energy transmitted in the form of a carrier wave having an analog signal of arbitrary message content modulated thereon or in the form of one or more sidebands, with or without a carrier, resulting from the modulation of a carrier wave by some external source. The modulation may consist of amplitude modulation, frequency, or phase modulation, or any combination thereof. The utilization means will in general comprise loud speaker means but may include visual reproduction means or in some cases a combination of both.
- (3) Note. Ordinarily this and the indented subclasses will not include patents whose claimed subject matter includes (a) devices for the operation and control of mechanical devices at a distance by radiant energy, (b) systems and devices for the reception and utilization of facsimile (television) or telegraph signals, (c) systems and devices for the reception of energy which utilize compressional waves in the audible range (telephony), (d) systems and apparatus restricted to the use of radio wave energy which is transmitted to and reflected from some object, the reflected energy being

received at a receiving station (i.e., radar), and (e) systems and apparatus for the communication of pulse or digital information.

SEE OR SEARCH CLASS:

- 74, Machine Element or Mechanism, subclasses 10+ for mechanical dial operators; and see the notes thereto for the electrical type.
- 178, Telegraphy, and 379, Telephonic Communications, appropriate subclasses for line instruments restricted to use in these arts, particularly Class 178, subclasses 15, 17, 48, and 88+ for receivers and recorders adapted to code-signalling.
- 327, Miscellaneous Active Electrical Non-linear Devices, Circuits, and Systems, subclasses 113+ for miscellaneous frequency conversion or control.
- 329, Demodulators, appropriate subclasses for demodulators in general and particularly subclasses 315+ for frequency demodulators, subclasses 345+ for phase demodulators, and subclasses 347+ for amplitude demodulators.
- 330, Amplifiers, appropriate subclasses for radio frequency, intermediate frequency, or audio frequency amplifiers, per se, useful in receivers in this class.
- 331, Oscillators, appropriate subclasses for electrical oscillator systems of general application, particularly subclasses 1+ for automatic frequency stabilized oscillators; and subclasses 37+ for beat frequency oscillators similar to the frequency conversion stage of a heterodyne type receiver.
- 334, Tuners, appropriate subclasses for specific adjustable resonant circuits, per se, utilizable as tuners for radio receivers.
- 343, Communications: Radio Wave Antennas, subclasses 5+ for reflected or otherwise returned wave systems, e.g., radar; and subclasses 100+ for directive radio wave energy systems including receivers; see subclass 113 for direction finding receivers; and subclasses 700+ for antennas which may be used with radio receivers.

- 370, Multiplex Communications, for modulated carrier wave receivers and systems designed to simultaneously receive a plurality of messages.
- 375, Pulse or Digital Communications, subclasses 316+ for pulse and digital modulated carrier wave receivers.
- 398, Optical Communications, various subclasses for optical communication.
- 714, Error Detection/Correction and Fault Detection/Recovery, subclasses 712+ for diagnostic test of transmission facility.

**131 Frequency conversion between signal source (e.g., wave collector) and receiver:**

This subclass is indented under subclass 130. Subject matter where the frequency of the signal supplied by the signal source (antenna or cable) is converted to another frequency which the receiver is able to receive.

**132 Plural receivers:**

This subclass is indented under subclass 130. Subject matter which comprises all of the essential elements (as defined in the definition of subclass 130 above and not merely by name only) of two or more separate receiver means, each of the receiver means being capable of, if detached from or removed from each of the other separate receivers, deriving a useful signal which is representative of useful information carried by an incoming modulated carrier wave and which plural receiver system is not otherwise classifiable.

- (1) Note. The subject matter found here may include a plurality of structurally claimed receiver means whose input is derived from separate antenna or collector means, or a plurality of receiver means having some stage in common; for example, a common local oscillator, volume control, or utilization means, provided, that each recited receiver means is capable, if acting along and utilizing the common stage, of deriving a signal representative of the useful information carried by the modulation signal. Systems wherein a plurality of individual receiver means are fed from a single antenna will not be found here but in subclasses 6.1+. For purposes of classification in this subclass a plurality of

receivers each receiving its input from a single source are considered to be merely a plurality of output channels for a single carrier wave input even though each of the channels performs the normal function of a complete receiver having a common input means and may be tuned to receive a different wave frequency.

- (2) Note. The plurality of receivers found in this and the indented subclasses will generally be located at the same geographical location (as in a rack) or closely adjacent thereto (as in a building or structure), for example, plural nondirectional receivers utilized in a diversity system. The antennas or collecting means may be situated at some distance apart, but in the same general vicinity. To be classified here the plurality of receivers must have some common cooperation or association one with another. For a plurality of receivers located at distant locations relative to each other even though they may be responsive to a particular carrier wave originating at single transmitter the search must be extended to the systems subclasses herein-above in this class or other appropriate classes.

**133 With output selecting:**

This subclass is indented under subclass 132. Subject matter where output signals from the several receivers are compared and a selected one of the output signals is either (a) applied to a utilization means, or (b) suppressed or prevented from appearing at the utilization means.

**134 By signal strength:**

This subclass is indented under subclass 133. Subject matter where the output signal is selected according to its amplitude.

**135 By signal quality (e.g., signal to noise ratio):**

This subclass is indented under subclass 133. Subject matter where the output signals are selected according to a measure of their signal quality.

**136 With control (e.g., automatic gain control, automatic frequency control, etc.):**

This subclass is indented under subclass 133. Subject matter having provision for controlling an operating characteristic of at least one of the receivers.

**137 With output combining:**

This subclass is indented under subclass 132. Subject matter where the outputs of two or more of the receivers are combined in an additive manner before being applied to a common utilization means.

**138 With control (e.g., automatic gain control):**

This subclass is indented under subclass 137. Subject matter where one or more of the operating characteristics of one or more of the receivers is controlled.

**139 Frequency or phase control:**

This subclass is indented under subclass 138. Subject matter where the frequency or phase of an oscillator in the receiver is controlled.

**140 Selectively actuated or controlled:**

This subclass is indented under subclass 132. Subject matter where each of the separate receivers may be independently energized, connected to a signal such as an antenna, individually tuned, or otherwise controlled to the exclusion of the others.

**141 Including common stage (e.g., local oscillator):**

This subclass is indented under subclass 132. Subject matter including one or more local oscillators or other stage which act in common with two or more of the receivers.

**142 Convertible to different type (e.g., AM to FM):**

This subclass is indented under subclass 130. Subject matter comprising a receiver whose circuit can be changed to receive at least two different types of modulation, for example, amplitude or frequency modulated waves.

- (1) Note. Such receivers may be of the superheterodyne type and employ a common pre-amplifier, converter, and intermediate frequency stage for both types of modulation.

**SEE OR SEARCH CLASS:**

- 370, Multiplex Communications, appropriate subclasses for digital combined with analog transmission.  
375, Pulse or Digital Communications, subclass 216 for digital convertible to/from analog.

**143 With distinct signal path for each type:**

This subclass is indented under subclass 142. Subject matter where the receiver contains a plurality of separate signal paths, each path being adapted for a different type of modulated signal, between the input and the output of receiver.

- (1) Note. An example of the subject matter found here may include separate diverse type collection means followed by a radio frequency stage or stages and a mixer with a common intermediate frequency stage followed by diverse detectors feeding a common audio frequency amplifier.

**144 With dual purpose amplifying or other stage:**

This subclass is indented under subclass 142. Subject matter including one or more stages which perform plural functions.

- (1) Note. Some examples of dual purpose stages are VHF and UHF amplifiers, amplifier and limiter, and AM-FM detector.

**145 Panoramic display:**

This subclass is indented under subclass 130. Subject matter including a cathode-ray oscilloscope for displaying the received signals.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

- 1, for transmitters controlled by a spectrum sweeping or panoramic type receiver for transmitting a jamming signal.

**SEE OR SEARCH CLASS:**

- 324, Electricity: Measuring and Testing, subclasses 76.12+ for apparatus for the analysis of complex electrical

- waves and which utilize panoramic display methods.
- 329, Demodulators, appropriate subclasses for a demodulator including a cathode-ray tube.
- 343, Communications: Radio Wave Antennas, subclasses 100+ for directive radio wave energy panoramic-type receivers utilized as radio beacons.
- 146 Plural separate paths or plural oscillators:**  
This subclass is indented under subclass 145. Subject matter wherein the receiver includes more than one individual circuit path or more than one local oscillator.
- (1) Note. For plural separator signal paths, at least a portion of the input carrier wave is conducted to an output utilization means by each path.
- (2) Note. For plural oscillators, the output of each oscillator is applied to one of a plurality of mixer or conversion means.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 143, 303+ and 313, for other types of receivers having plural signal paths therein.
- 315+, for plural frequency conversion means with plural local oscillators.
- 147 Particular local oscillator control:**  
This subclass is indented under subclass 145. Subject matter wherein the receiver includes particular means whereby the frequency of the local oscillator means is maintained constant or whereby some other operating condition of the oscillator means is controlled.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 164.1, for scanning receivers with automatic frequency control.
- 173.1, for mechanical or electromechanical frequency selection means with automatic frequency control.
- 182.1, for channel or station selection with automatic frequency control.
- 208+, for frequency or phase modulation type receivers with synchronized or controlled local oscillator means.
- 255+, for automatic frequency control systems for receivers in general.
- 316, for receivers with frequency conversion means with frequency stabilizing means for the local oscillator.
- 148 With oscilloscope sweep signal derivation or control:**  
This subclass is indented under subclass 145. Subject matter wherein the receiver includes particular means for generating or controlling the voltage applied to the oscilloscope (e.g., control of voltage amplitude or cathode-ray beam intensity).
- SEE OR SEARCH CLASS:
- 315, Electric Lamp and Discharge Devices: Systems, subclasses 364+ for cathode-ray tube deflection systems in general, particularly subclasses 383+ for ray beam intensity control.
- 327, Miscellaneous Active Electrical Non-linear Devices, Circuits, and Systems, subclasses 131+ for miscellaneous sawtooth or ramp circuit.
- 331, Oscillators, subclasses 143+ for free running relaxation oscillators utilized as sawtooth generators.
- 149 Plural output (e.g., plural speakers) (not stereo):**  
This subclass is indented under subclass 130. Subject matter where the receiver has a plurality of separate outputs.
- (1) Note. Stereo receivers are classified in Class 381, subclasses 1+.
- 150.1 Signal selection based on frequency (e.g., tuning):**  
This subclass is indented under subclass 130. Subject matter comprising means to cause the receiver to respond, selectively, to any one of two or more carrier waves.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 77, for transceivers tuning.
- 120+, for transmitters with tuning.
- 340, for receivers in general with adjustable tuning means between stages.

## SEE OR SEARCH CLASS:

- 74, Machine Element or Mechanism, subclasses 10+ for a radio tuner by names only when claimed in combination with shaft positioning means.
- 324, Electricity: Measuring and Testing, subclasses 76.39+ for systems for measuring the frequency of a cyclic current or voltage by tuning to resonance with a reference source.
- 327, Miscellaneous Active Electrical Non-linear Devices, Circuits, and Systems, subclasses 1+ for miscellaneous discriminating circuits and particularly subclasses 39+ for frequency discrimination.
- 334, Tuners, appropriate subclasses for tuners, per se.
- 336, Inductor Devices, appropriate subclass for specific type inductor, per se, which may be used in a selective circuit, see particularly subclasses 130+.
- 340, Communications: Electrical, subclasses 870.4+ for telemetering systems including selective receivers.
- 342, Communications: Directive Radio Wave Systems and Devices (e.g., Radar, Radio Navigation), subclasses 5+ for radar receivers with wave selecting means and subclasses 100+ for directive receivers with selecting means.
- 346, Recorders, subclass 37 for the combination of a tuning responsive radio receiver with recording means.
- 348, Television, subclasses 725+ for television receivers having frequency selecting means.
- 361, Electricity: Electrical Systems and Devices, subclasses 182+ for electric control circuits for relays which are frequency responsive.
- 370, Multiplex Communications, appropriate subclass for multiplex receivers with frequency selection means.
- 375, Pulse or Digital Communications, subclasses 316+ for pulse receivers with frequency selection.

**151.1 Remote control of channel or station selection:**

This subclass is indented under subclass 150.1. Subject matter wherein the tuning means includes a control means that is actuated at a distance from the receiver.

## SEE OR SEARCH THIS CLASS, SUBCLASS:

352+, for remote control of receivers for other than signal selection.

## SEE OR SEARCH CLASS:

334, Tuners, subclasses 8+ for remotely controlled tuner which claims significant details of the tuner.

**151.2 Wireless link (sonic, RF or infrared):**

This subclass is indented under subclass 151.1. Subject matter wherein the remote control device is not physically connected to the receiver and generates an acoustic wave, an electromagnetic wave, or a pulse train (e.g., sonic, RF, or infrared).

## SEE OR SEARCH CLASS:

340, Communications: Electrical, subclasses 2.1 through 2.8 for path selection.

**151.3 Remote oscillator tuned:**

This subclass is indented under subclass 151.1. Subject matter wherein the control means includes an oscillator which generates alternating-current power at a frequency which may be changed at will by the operator.

**151.4 Plural electronic devices controlled:**

This subclass is indented under subclass 151.1. Subject matter wherein the remote control apparatus operates at least two or more receivers.

**152.1 Of or combined with vehicle receiver:**

This subclass is indented under subclass 151.1. Subject matter wherein the receiver system has tuning means in addition to the remote control means and is carried by or combined with a land vehicle (e.g., automobile).

SEE OR SEARCH THIS CLASS, SUB-CLASS:

297, for receiver having noise or interference elimination combined with vehicle structure.

**153.1 Mechanical:**

This subclass is indented under subclass 151.1. Subject matter wherein the receiver includes mechanical means responsive to the remote control device to the carrier wave.

**153.2 With wired link:**

This subclass is indented under subclass 153.1. Subject matter wherein the remote control device is electrically connected to the receiver by a cable or a wire.

(1) Note. Wire may carry current to a motor in the receiver which actuates the mechanical means to vary the frequency response.

**154.1 With indication of frequency, channel, or selector condition (e.g., tuning aid):**

This subclass is indented under subclass 150.1. Subject matter including means for making a condition pertaining to the tuning of the receiver perceptible to a human operator.

(1) Note. This subclass and the indented subclass may also include TV tuning or channel indicators wherein the TV receiver is broadly claimed which does not include any particular TV processing circuitry, e.g., horizontal or vertical sync circuitry, etc.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

115.1 through 115.4, for transmitters with tuning indicator.

145+, for receivers with panoramic display.

SEE OR SEARCH CLASS:

74, Machine Element or Mechanism, subclasses 10+ for mechanical radio tuning mechanisms which may include dial indication means.

116, Signals and Indicators, subclasses 241+ for radio tuning indicators.

324, Electricity: Measuring and Testing, subclasses 76.11+ for devices for measuring or testing electricity, per se, and having indication means, particularly indented subclasses 76.49 and 76.51 for frequency measuring systems employing tuned circuits.

329, Demodulators, subclasses 315+ for frequency detectors with indication means.

331, Oscillators, subclass 64 for oscillator devices with indicating means.

334, Tuners, appropriate subclasses for tuning devices, per se, with indicating means.

342, Communications: Directive Radio Wave Systems and Devices (e.g., Radar, Radio Navigation), subclasses 350+ for directive radio energy receivers with indicating means.

345, Computer Graphics Processing and Selective Visual Display Systems, subclasses 1.1 through 111 for visual display systems with selective electrical control.

348, Television, subclasses 569+ for television receivers with tuning indicators.

381, Electrical Audio Signal Processing Systems and Devices, subclass 12 for stereo receivers with indicators.

**154.2 Scanning display:**

This subclass is indented under subclass 154.1. Subject matter having means to automatically and continuously varies the carrier wave frequency to which the receiver is tuned and means to continuously display the frequency.

**155.1 By meter:**

This subclass is indented under subclass 154.1. Subject matter comprising a movable visual indication actuated by electromagnetic means.

**156.1 Audible indicator:**

This subclass is indented under subclass 154.1. Subject matter comprising means to generate a specific tone or sound or to vary the normal sound output of the receiver.

**157.1 Analog frequency indication (e.g., dial):**

This subclass is indented under subclass 154.1. Subject matter including means for indicating the frequency value of the carrier wave to

which the receiver is adjusted or tuned (e.g., tuning dial with a pointer).

SEE OR SEARCH THIS CLASS, SUB-CLASS:

67.11 through 67.7, for transmitters and receivers at separate stations with measuring, testing, and monitoring which may include the frequency display of the receiver.

226.1, for receiver measuring, testing, and calibration apparatus which may include means for displaying the actual receiver tuned frequency.

**157.2 With light indication or bar type:**

This subclass is indented under subclass 157.1. Subject matter wherein the perceptible means is a line divided into equal measures which is variably illuminated to indicate the condition.

**158.1 Channel index indication:**

This subclass is indented under subclass 154.1. Subject matter wherein the indication means displays information pertaining to the identity of the channel or station to which the receiver is tuned.

SEE OR SEARCH CLASS:

345, Computer Graphics Processing and Selective Visual Display Systems, subclasses 168+ for keyboard input for a visual display system with selective electrical control, and subclasses 33+ and 467-472.3 for particular types of character displays in a visual display system with selective electrical control.

348, Television, subclasses 569+ for TV receivers which may include channel number displays.

**158.2 With electronic digital indication:**

This subclass is indented under subclass 158.1. Subject matter wherein the display means is an electronic means for visually representing the channel or station number (e.g., seven-segment numerical display).

**158.3 Using a counter:**

This subclass is indented under subclass 158.2. Subject matter wherein the electronic means includes a counter which counts control pulses transmitted by the remote control device to

cause the receiver to be tuned from channel to channel.

SEE OR SEARCH CLASS:

377, Electrical Pulse Counters, Pulse Dividers, or Shift Registers: Circuits and Systems, appropriate subclasses for pulse counting means, per se.

**158.4 With multiple display functions:**

This subclass is indented under subclass 158.1. Subject matter wherein the channel index indicating means also displays another kind of information (e.g., time of day, frequency, stereo mode, etc.).

**158.5 Non-numeric display (e.g., call letters):**

This subclass is indented under subclass 158.1. Subject matter wherein the channel index indication includes alphanumeric data about a received channel.

**159.1 Variable light indication:**

This subclass is indented under subclass 154.1. Subject matter which the condition is indicated by a variable light source.

(1) Note. The variable light indication source may be an electron beam "ray" tube or LED by which tuning may be adjusted correctly.

**159.2 Plural lamps:**

This subclass is indented under subclass 159.1. Subject matter wherein the variable light indicator contains at least two or more light sources.

**160.1 Plural tuning modes (e.g., manual and scanning, etc.):**

This subclass is indented under subclass 150.1. Subject matter having two or more signal selection means (e.g., manual and automatic scanning and means to selectively actuate one of the signal selection means).

(1) Note. This subclass is restricted to plural discrete selection modes. Systems such as coarse tuning and fine tuning are excluded.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

161.1+, for frequency scanning receivers.

- 170.1+, for receivers with manual, mechanical, or electromechanical selection.
- 173.1, 182.3, and 192.3 for systems such as coarse tuning and fine tuning.
- 179.1+, for channel or station selection receivers.
- 188.1+, for band selection receivers.

### 161.1 Frequency scanning:

This subclass is indented under subclass 150.1. Subject matter in which the selection means includes means for automatically tuning the receiver through a desired frequency range or a plurality of frequency ranges to obtain a carrier signal having predetermined characteristics (e.g., frequency, amplitude).

- (1) Note. The selection means in this subclass and the indented subclasses may include electrical, mechanical, or electromechanical systems. For example, the selection means may be adjusted to resonance at a desired frequency automatically by the action of a manually operated button, lever, dial, or knob means or means whereby the selection means is locked or clamped in a predetermined position as a consequence of the frequency of the received input carrier signal.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 32, for receiver selection with scanning.
- 77, for transceivers with automatic tuning.
- 125, for transmitters with automatic adjustment of tuning.
- 145, for panoramic receivers with frequency scanning.

SEE OR SEARCH CLASS:

- 324, Electricity: Measuring and Testing, subclasses 76.12+ for frequency spectrum analyzers using scanning receivers.
- 348, Television, subclass 734 for television receivers with search tuning.

### 161.2 With processor control:

This subclass is indented under subclass 161.1. Subject matter wherein the means includes a programmable controller for automatically tun-

ing the receiver through the desired frequency range.

### 161.3 Using signal strength or quality:

This subclass is indented under subclass 161.1. Subject matter wherein the predetermined characteristic is the strength of the information signal or the signal-to-noise ratio.

### 162.1 Motor activated:

This subclass is indented under subclass 161.1. Subject matter in which the selection means is controlled by a motor.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 170.1+, for signal selection receivers employing mechanical or electromechanical selection means such as a motor, particularly subclass 172.1 for time activated receiver selection combined with a motor.

SEE OR SEARCH CLASS:

- 318, Electricity: Motive Power Systems, appropriate subclasses for generic motor control device.
- 334, Tuners, subclasses 20+ for motor operated band scanning or selector circuit for tuners, per se.

### 163.1 Reversible motor (e.g., end-stop control):

This subclass is indented under subclass 162.1. Subject matter in which the motor is bidirectional and circuit means is provided for controlling the direction of operation.

- (1) Note. This subclass provides for selective receivers in which the tuning means has limitations in motion and cam or other actuating means controls the motor circuit to prevent damage.

SEE OR SEARCH CLASS:

- 318, Electricity: Motive Power Systems, subclass 626 for limit or end-stop control of an electric motor in a servo system and subclasses 280+ for motor reversing systems.

### 164.1 With automatic frequency control:

This subclass is indented under subclass 161.1. Subject matter including a self-regulating control circuit in the receiver which compensates

for small variations in a carrier signal frequency to provide a stable audio output.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 75, for transceivers with frequency stabilization.
- 119, for transmitters with automatic frequency control.
- 173.1, for manual, mechanical, or electromechanical frequency selection means with automatic frequency control.
- 182.2, for channel or station selection with automatic frequency control.
- 192.2, for receiver tuning in general with automatic frequency control or fine tuning control.
- 257, for nontuning receivers with automatic frequency control.

SEE OR SEARCH CLASS:

- 331, Oscillators, subclasses 1+ for oscillators having automatic frequency control.
- 348, Television, subclass 735 for television receivers with automatic frequency control.

**164.2 Processor controlled (AFC):**

This subclass is indented under subclass 164.1. Subject matter wherein the automatic frequency control is controlled by a programmable controller.

- (1) Note. The processor may be a microprocessor.

**165.1 With frequency synthesizer:**

This subclass is indented under subclass 161.1. Subject matter wherein the selection means includes means for deriving a plurality of local oscillator frequencies from a variable frequency oscillator by frequency multiplication or division.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 76, for transceivers with frequency synthesizers.
- 183.1, for channel or station selection with frequency synthesizers.
- 260, for automatic frequency control receivers with frequency synthesizers.

SEE OR SEARCH CLASS:

- 331, Oscillators, subclasses 1+ for automatic oscillator frequency control, particularly subclass 1 for oscillator frequency control circuits with particular logic elements (e.g., programmable divider in a phase locked loop).

**166.1 With channel skipping selection:**

This subclass is indented under subclass 161.1. Subject matter including means to cause pass over of certain carrier frequencies during the scanning process.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 175.1, for manual, mechanical, or electromechanical frequency selection means with channel preset.

**166.2 With priority channel selection:**

This subclass is indented under subclass 166.1. Subject matter wherein the channel skipping selection includes means to cause the selection of preferred carrier frequencies over other carrier frequencies.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 179.1, which may include preferred channel selection.

**167.1 With dual sweeping:**

This subclass is indented under subclass 161.1. Subject matter including a plurality of means (e.g., two sweeping oscillators) operating in sequence to cause receiver scanning.

**168.1 Multiband:**

This subclass is indented under subclass 161.1. Subject matter including means for scanning the receiver over a plurality of frequency bands.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 176.1, for manual, mechanical, or electromechanical frequency selection means combined with band selection.
- 180.1, for channel selection combined with band selection.
- 188.1+, for general band selection circuits.

## SEE OR SEARCH CLASS:

334, Tuners, subclasses 18+ for band scanning used in an electromagnetic operated tuner.

**169.1 With particular variable voltage or current tuning:**

This subclass is indented under subclass 161.1. Subject matter including particular means for providing a changeable voltage or current to a receiver oscillator for scanning.

(1) Note. Some significant detail of the voltage or current supply of receiver oscillator scanning must be claimed for classification in this subclass.

## SEE OR SEARCH THIS CLASS, SUBCLASS:

195.1, for signal selection systems in general using variable voltage or current tuning.

## SEE OR SEARCH CLASS:

334, Tuners, subclasses 11+ for particular variable voltage or current responsive tuners.

**169.2 With varactor diode:**

This subclass is indented under subclass 169.1. Subject matter wherein the particular variable voltage or current tuning means includes a two-terminal semiconductor device capacitance varies with the applied voltage.

**170.1 With mechanical or electromechanical selection:**

This subclass is indented under subclass 150.1. Subject matter including mechanical or electromechanical operating devices (e.g., knobs, push buttons, tuning shafts, movable cores, ganged elements, etc.) for tuning the receiver.

## SEE OR SEARCH THIS CLASS, SUBCLASS:

120+, for transmitter tuning which may include manual, mechanical, or electromechanical means for frequency selection.

160.1, for receivers comprising plural selection modes which may include manual, mechanical, or electromechanical selection means.

161.1+, for frequency scanning receivers which may include manual, mechanical, or electromechanical means for frequency selection.

## SEE OR SEARCH CLASS:

74, Machine Element or Mechanism, subclasses 10+ for mechanical radio tuning mechanisms.

334, Tuners, appropriate subclasses for mechanical or electromagnetic type tuners.

**171.1 Time actuated:**

This subclass is indented under subclass 170.1. Subject matter wherein the mechanical or electromechanical selection means is controlled by a timing device (e.g., clock).

## SEE OR SEARCH THIS CLASS, SUBCLASS:

181.1, for channel or station selection which is controlled or programmed by a timing device.

231, for receiver combined with diverse device, such diverse device being a clock.

## SEE OR SEARCH CLASS:

368, Horology: Time Measuring Systems or Devices, appropriate subclasses for particular clock structure.

**172.1 Including a motor:**

This subclass is indented under subclass 171.1. Subject matter wherein the selection means is done by an electric motor.

## SEE OR SEARCH THIS CLASS, SUBCLASS:

162.1, for motor activated frequency scanning receivers.

## SEE OR SEARCH CLASS:

334, Tuners, subclasses 20+ for motor activated band scanning or selector circuit for tuners, per se.

**173.1 With automatic frequency control of fine tuning:**

This subclass is indented under subclass 170.1. Subject matter wherein the manual, mechanical, or electromechanical means includes means for automatically stabilizing a receiver

local oscillator frequency or means to permit fine adjustment of the local oscillator to the carrier frequency of a signal.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 75, for transceivers with frequency stabilization (e.g., AFC).
- 119, for transmitters with automatic carrier frequency stabilization.
- 164.1+, for frequency scanning receivers with automatic frequency control.
- 182.1+, for channel or station selection receivers with automatic frequency control or fine tuning control.
- 192.1+, for signal selection in general with automatic frequency control or fine tuning control.
- 255, for nontuning receivers with automatic frequency control.

SEE OR SEARCH CLASS:

- 334, Tuners, subclasses 13, 16, and 26+ for tuners with automatic frequency centering circuits.

**174.1 With muting (e.g., silent tuning):**

This subclass is indented under subclass 170.1. Subject matter including means for silencing the receiver at all times except when the signal selection means is exactly adjusted to the desired carrier frequency.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 194.1+, for signal selection receivers (nonmechanical type) with muting.
- 212+, for FM receivers with muting or squelch circuits.
- 218+, for receivers in general with muting or squelching circuits.

**175.1 With carrier wave preset:**

This subclass is indented under subclass 170.1. Subject matter including means for preselecting a desired carrier wave frequency (e.g., by push buttons).

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 160.1, for receivers with plural signal selection modes wherein at least one such mode may be a preset signal selection mode.

166.1+, for frequency scanning receivers which may comprise means for preselecting a channel to be skipped or a priority channel to be monitored.

186.1+, for channel or station selection receivers with means for programming predetermined channel information into a storage memory.

SEE OR SEARCH CLASS:

- 334, Tuners, subclass 29 for tuners with predetermined center frequency selectors.

**176.1 Combined with band selection:**

This subclass is indented under subclass 170.1. Subject matter including means for selecting one of a plurality of carrier wave bands.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 168.1, for multiband frequency scanning receivers.
- 180.1, for channel or station selection receivers combined with band selection.
- 188.1+, for band selection receivers in general.

SEE OR SEARCH CLASS:

- 334, Tuners, subclasses 18+ for band selector with electromagnetic operator.

**177.1 Combined with other control (e.g., bandwidth, volume, gain, etc.):**

This subclass is indented under subclass 170.1. Subject matter including additional means for controlling other functions of the receiver (e.g., bandwidth, volume, gain, etc.).

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 200.1, for nonmechanical or nonelectromechanical-type frequency selection receivers with other control.
- 232+, for receivers in general with gain, level, or volume control.
- 266, for receivers with selectivity or bandwidth control.

**178.1 With plurality of tunable circuits:**

This subclass is indented under subclass 170.1. Subject matter including separate circuits each being adjustable by the operation of manual,

mechanical, or electromechanical means (e.g., tuning shaft).

SEE OR SEARCH THIS CLASS, SUBCLASS:

187.1, for channel or station selection receivers using separate tuned circuits for each channel or station.

191.1+, for band selection receivers with plural tuned circuits or tunable coupled stages.

SEE OR SEARCH CLASS:

334, Tuners, subclass 2 for plural diverse type tuners and subclasses 42+ for resonant line element tuners employing plural operated tuning units.

**179.1 Channel or station selection:**

This subclass is indented under subclass 150.1. Subject matter including means to tune the receiver to a desired carrier wave frequency.

- (1) Note. This subclass and the indented subclasses may also include TV channel or station selections wherein the TV receiver is broadly claimed and does not include any particular TV processing circuitry, e.g., horizontal and vertical sync, circuitry, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:

73+, for transceivers which may include channel selection means.

151.1, for remote control of channel or station selection.

160.1, for receivers with plural selection modes which may include channel selection means.

161.1+, for frequency scanning receivers which may include channel selection means, particularly subclasses 166.1+ for channel skipping or priority channel selection.

170.1+, for receivers with mechanical or electromechanical selection which may include channel selection means.

SEE OR SEARCH CLASS:

334, Tuners, appropriate subclasses for tuners, per se, with channel or station selection means.

348, Television, subclasses 570 and 731+ for television channel or station selections with such particular processing circuitry.

**180.1 Combined with band selection:**

This subclass is indented under subclass 179.1. Subject matter including means in addition to the channel selection means for selecting a desired frequency range from a plurality of frequency ranges, whereby a channel frequency can be selected from such desired frequency range.

SEE OR SEARCH THIS CLASS, SUBCLASS:

77, for transceivers with tuning which may include band selection means.

168.1, for frequency scanning receivers with band selection means.

176.1, for receivers with mechanical or electromechanical selection means combined with band selection.

188.1+, for band selection receivers in general.

SEE OR SEARCH CLASS:

348, Television, subclasses 570 and 731+ for TV tuning which may include band selection means (e.g., UHF, VHF).

**180.2 UHF and VHF:**

This subclass is indented under subclass 180.1. Subject matter wherein the desired frequency range is within 30 to 3000 MHz.

SEE OR SEARCH THIS CLASS, SUBCLASS:

188.2, for band selection receivers in general which include UHF and VHF band.

**180.3 With phase locked loop (PLL) tuning:**

This subclass is indented under subclass 180.2. Subject matter wherein the tuning means includes a tuning circuit whose output locks onto and tracks a reference signal for tuning the desired frequency.

- (1) Note. Phase locking is accomplished by comparing the phase of an output signal and the reference signal, and then converting any difference into a correction voltage that changes the phase of output

so it matches that of the reference or the input signal.

**180.4 Varactor tuned (e.g., varactor diode):**

This subclass is indented under subclass 180.2. Subject matter including a two-terminal semiconductor device capacitance for tuning the desired channel or station frequency.

**181.1 Time controlled:**

This subclass is indented under subclass 179.1. Subject matter wherein the channel or station selection means is activated or programmed by a timing device (e.g., clock).

SEE OR SEARCH THIS CLASS, SUBCLASS:

171.1, for receivers with manual, mechanical, or electromechanical selection means controlled by a timing device.

**182.1 With frequency control:**

This subclass is indented under subclass 179.1. Subject matter wherein the channel or station selection includes a local oscillator and a control means for stabilizing the oscillator frequency.

SEE OR SEARCH THIS CLASS, SUBCLASS:

75, for transceiver with frequency stabilization.

164.1+, for frequency scanning receivers with automatic frequency control.

173.1, for receivers with mechanical or electromechanical frequency selection means using AFC or fine tune control.

192.1+, for signal selection with AFC or fine tuning control.

257+, for receivers in general with automatic frequency control.

**182.2 Automatic (AFC):**

This subclass is indented under subclass 182.1. Subject matter wherein the control means is a self-regulating control circuit in the receiver which compensates for small variations in a carrier signal frequency to provide a stable audio output.

SEE OR SEARCH CLASS:

348, Television, subclass 735 for television receiver with automatic frequency control.

**182.3 Fine tuning:**

This subclass is indented under subclass 179.1. Subject matter wherein the channel or station selection means includes a local oscillator and means to permit fine adjustment (either manually or automatically, i.e., AFT) of the oscillator frequency.

**183.1 With frequency synthesizer:**

This subclass is indented under subclass 179.1. Subject matter including means for deriving a plurality of local oscillator frequencies from a variable frequency oscillator by frequency multiplication or division.

SEE OR SEARCH THIS CLASS, SUBCLASS:

76, for transceivers with frequency synthesizers.

165.1, for frequency scanning receivers with frequency synthesizers.

260, for automatic frequency control receivers with frequency synthesizers.

SEE OR SEARCH CLASS:

331, Oscillators, subclass 1 for oscillator frequency control circuits with particular logic elements (e.g., programmable divider in a phase locked loop).

**183.2 Processor controlled:**

This subclass is indented under subclass 183.1. Subject matter wherein the frequency synthesizer includes a programmable controller for selecting an appropriate one of the local oscillator frequencies to tune the receiver to the desired channel or station.

**184.1 With comparing desired and existing tuning conditions:**

This subclass is indented under subclass 179.1. Subject matter including comparison means for determining the difference between the carrier wave to which the receiver is currently tuned and a newly selected carrier wave.

SEE OR SEARCH THIS CLASS, SUBCLASS:

161.1+, for frequency scanning receivers which may include comparison means.

170.1+, for manual, mechanical, or electromechanical frequency selection which may also include comparison means.

**185.1 With channel information storage:**

This subclass is indented under subclass 179.1. Subject matter including means for storing about the channel to which the receiver is tuned.

- (1) Note. This subclass may include a digital memory for storing channel number representation or a storage capacitor for storing channel voltage.

SEE OR SEARCH THIS CLASS, SUBCLASS:

77+, for transceiver tuning which may include channel information storage.

161.1+, for frequency scanning receivers which may include channel information storage.

**186.1 With memory control or programming:**

This subclass is indented under subclass 185.1. Subject matter including means for controlling the address or readout of the storage means.

SEE OR SEARCH CLASS:

365, Static Information Storage and Retrieval, appropriate subclasses for generic memory device, particularly subclasses 185.01+ for floating gate memory storage (e.g., flash memory).

**186.2 Having a keyboard:**

This subclass is indented under subclass 186.1. Subject matter wherein the controlling means includes an array of push-button switches with related functions for programming the channel information.

SEE OR SEARCH CLASS:

200, Electricity: Circuit Makers and Breakers, appropriate subclasses for generic switches.

341, Coded Data Generation or Conversion, subclasses 22+ for bodily actuated code generator including keyboard or keypad.

**187.1 Separate tuned circuits for each channel or station:**

This subclass is indented under subclass 179.1. Subject matter including a plurality of separate and distinct circuit means each of which is tuned or tunable to resonate at a particular frequency corresponding to the frequency of a modulated carrier wave channel.

- (1) Note. Each of the plurality of circuit means may be preadjusted to be resonant at the carrier frequency of a separate transmitting station and may be selectively inserted into the system at random or in a sequential order.

SEE OR SEARCH THIS CLASS, SUBCLASS:

178.1, for receivers with manual, mechanical, or electromechanical selection means using a plurality of tunable circuits.

SEE OR SEARCH CLASS:

334, Tuners, appropriate subclasses, especially subclass 7 for push button-type tuners utilizing a plurality of tuned selector circuits.

**188.1 Band selection:**

This subclass is indented under subclass 150.1. Subject matter including means for selecting ranges of radio frequencies lying between specified sets of limits, each range including one or more carrier wave channels.

SEE OR SEARCH THIS CLASS, SUBCLASS:

77+, for transceiver tuning which may include band selection means.

168.1, for multiband frequency scanning receivers which may include band selection means.

176.1, for mechanical or electromechanical frequency selection receivers combined with band selection.

180.1, for channel or station selection receivers combined with band selection.

**SEE OR SEARCH CLASS:**

- 324, Electricity: Measuring and Testing, subclasses 76.39+ for frequency measuring systems which may include band changing or selection means.
- 334, Tuners, appropriate subclasses for tuners with band selection or changing means.
- 342, Communications: Directive Radio Wave Systems and Devices (e.g., Radar, Radio Navigation), subclasses 350+ for directive radio energy receivers which may include band selection means.
- 348, Television, subclasses 570 and 731+ for TV tuning receivers which may include band selection means.
- 370, Multiplex Communications, appropriate subclass for multiplex receivers which may include band selection means.

**188.2 UHF and VHF:**

This subclass is indented under subclass 188.1. Subject matter wherein the frequency range is within 30 to 3000 MHz.

**189.1 With plural separate mixer or converter circuits:**

This subclass is indented under subclass 188.1. Subject matter including two or more separate and distinct means for generating an output signal equal to the sum or difference of a local oscillator frequency and the carrier wave frequency or means for converting the carrier wave frequency to some other frequency by combining it with another frequency.

- (1) Note. The separate conversion means may be in separate signal channel paths for providing separate intermediate frequency outputs or may provide input signals for a common intermediate frequency channel.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

- 22, for radio repeaters with plural conversion stages.
- 146, for panoramic receivers which may comprise plural separate mixers or converter circuits.

168.1, for frequency scanning receivers which may comprise plural separate mixers or conversion circuits.

176.1, for manual, mechanical, or electromechanical signal selection combined with band selection which may include plural frequency conversion means.

180.1, for channel or station selection receivers combined with band selection means which may comprise plural frequency conversion circuits.

207, for frequency modulation receivers with plural conversion means.

314+, for receivers with frequency conversion systems comprising a plurality of plural separate successive conversion means.

**190.1 With frequency conversion:**

This subclass is indented under subclass 188.1. Subject matter including means for converting the carrier wave frequency to some other frequency by combining it with another frequency.

- (1) Note. The converting means may, for example, be a separate frequency band converter, connected between the antenna and the receiver input for adapting a receiver operative in one frequency band (e.g., VHF) to receive signals in another frequency band (e.g., UHF).

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

142+, for systems wherein a receiver adapted to receive a wave containing a first type modulation component has means to convert it to receive a wave containing a second type modulation component or vice versa (e.g., AM or FM).

**191.1 With plurality of tuned circuits:**

This subclass is indented under subclass 188.1. Subject matter including two or more tuned circuits each tunable to a different frequency.

- (1) Note. The separate tuned circuits need not consist of separate distinct physical elements, but any two or more may share one or more elements in common. As an example, a single inductance may be

divided into sections with one or more sections being parallel connected with a capacitor whereby each of the sections when so connected constitutes a separate tuned circuit. The plurality of tuned circuits may be situated either in the input to or the output of a radio frequency amplifier.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

340, for receivers in general with tunable or adjustable coupling circuits between stages.

SEE OR SEARCH CLASS:

334, Tuners, appropriate subclasses for band selecting tuners, per se.

**191.2 Varactor tuned:**

This subclass is indented under subclass 191.1. Subject matter wherein the plurality of tuned circuits includes a two-terminal semiconductor capacitive device for tuning a desired frequency range.

**191.3 With switching between stages:**

This subclass is indented under subclass 191.1. Subject matter wherein the plurality of tuned circuits includes a mechanical or electrical device that completes or breaks a signal path or sends the signal over a different path.

**192.1 With frequency control:**

This subclass is indented under subclass 150.1. Subject matter including a control means for stabilizing a receiver local oscillator frequency.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

75, for transceivers with automatic frequency control.

119, for transmitters with automatic frequency control.

164.1, for frequency scanning receivers with automatic frequency control.

182.1+, for channel or station selection receivers with frequency control.

255, for nontuning receivers with automatic frequency control.

**192.2 Automatic (AFC):**

This subclass is indented under subclass 192.1. Subject matter wherein the control means is a self-regulating control circuit in the receiver which compensates for small variations in a carrier signal frequency to provide a stable audio output.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

164.1, for frequency scanning receivers with automatic frequency control.

173.1, for receivers with mechanical or electromechanical frequency selection means using AFC or fine tuning control.

182.2, for channel or station selection receivers with automatic frequency control.

SEE OR SEARCH CLASS:

348, Television, subclass 735 for television receiver with automatic frequency control.

**192.3 Fine tuning:**

This subclass is indented under subclass 192.1. Subject matter wherein the control means includes means to permit fine adjustment (either manually or automatically, i.e., AFT) of the local oscillator to the carrier frequency of a desired signal.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

173.1, for receivers with mechanical or electromechanical frequency selection means using AFC or fine tuning control.

182.3, for channel or station selection receivers with manual or automatic fine tuning.

**193.1 With antenna circuit tuning:**

This subclass is indented under subclass 150.1. Subject matter wherein the signal selection means comprises a tunable RF circuit coupled to a carrier wave reception means.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

121+, for tunable transmitters with tuning means in the antenna circuit.

- 275, for receivers with plural antennas and including frequency selecting means.
- 289, for receivers with tunable coupling means between the antenna and receiver input.
- 193.2 With plural resonant circuits:**  
This subclass is indented under subclass 193.1. Subject matter wherein the tunable antenna circuit includes a plurality circuits which contain both inductance and capacitance and are therefore tuned to a resonance at a certain frequency.
- 193.3 Including varactor diode:**  
This subclass is indented under subclass 193.1. Subject matter wherein the tunable RF circuit includes a two-terminal semiconductor capacitive device.
- 194.1 With muting (e.g., silent tuning):**  
This subclass is indented under subclass 150.1. Subject matter comprising a means to silence the receiver while it is being tuned to the desired carrier frequency (e.g., silent tuning).
- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
174.1, for mechanical or electromechanical signal selection receivers with muting means.  
212, for frequency or phase modulation receivers having squelch circuits or other output silencing.  
218, for receivers having squelch in general.
- 194.2 Amplifier controlled:**  
This subclass is indented under subclass 194.1. Subject matter wherein the means includes an amplifier in a received signal path whose gain is controlled in such a manner that the audio output is muted during the silent tuning.
- 195.1 Variable voltage or current tuning:**  
This subclass is indented under subclass 150.1. Subject matter wherein the means to select the carrier wave frequency is responsive to voltage or current.
- (1) Note. Some significant detail of the voltage or current supply for carrier signal selection must be claimed for classification in this subclass.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
169.1+, for frequency scanning receivers with particular variable voltage or current tuning.
- SEE OR SEARCH CLASS:  
334, Tuners, subclasses 11+ for particular variable voltage or current responsive tuners.
- 196.1 Including variation of local oscillator frequency:**  
This subclass is indented under subclass 150.1. Subject matter which includes a variable frequency source of unmodulated oscillation.
- (1) Note. Signal frequency selection effected by frequency variation of the oscillation source is classified herein.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
320, for a frequency converter with a local oscillator in which the coupling means is variably tuned.
- 197.1 By simultaneous control with signal selection:**  
This subclass is indented under subclass 196.1. Subject matter in which the local oscillator frequency and the carrier wave frequency are varied by a common actuator.
- 197.2 Variable capacitor tuned:**  
This subclass is indented under subclass 197.1. Subject matter comprising an RF tuned circuit and an oscillator tuned circuit, each containing a variable capacitor which is tuned by the common actuator.
- 197.3 Including additional tuning circuit:**  
This subclass is indented under subclass 197.2. Subject matter including more than two resonant circuits in combination with an additional resonant circuit having a variable capacitor which is varied by the common actuator.
- 198.1 Including distributed parameter control device:**  
This subclass is indented under subclass 197.1. Subject matter wherein the means to select either the carrier wave or the local oscillator

frequency is of the electromagnetic wave transmission type (e.g., resonators, waveguides).

SEE OR SEARCH CLASS:

333, Wave Transmission Lines and Networks, appropriate subclasses for such distributed parameter devices and networks.

334, Tuners, subclasses 41+ for tuners having resonant line elements.

**199.1 Discrete frequency types (e.g., channel switching):**

This subclass is indented under subclass 197.1. Subject matter in which the frequency selection means selects distinct, spaced apart, frequencies.

SEE OR SEARCH THIS CLASS, SUBCLASS:

179.1, for similar signal selectors absent local oscillator frequency variation.

**200.1 With other control (e.g., volume, gain, bandwidth, etc.):**

This subclass is indented under subclass 150.1. Subject matter including significant details of the signal selection means combined with at least one other functional control means.

- (1) Note. To complete the field of search in this class for subject matter found in this subclass, and in which the said other control means is included in some detail, further search must be made in the appropriate subclass relating to the particular control means.
- (2) Note. Wherein the subject matter claimed includes two or more type of control means equally claimed as to significant details classification will be in the subclass relating to the particular control means which is highest in the schedule. For example, wherein volume control and tuning control are both claimed with equal particularity, classification will be in subclass 200 with an official cross-reference in subclass 233, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:

177.1, for manual, mechanical, or electromechanical type signal selection receivers with other control means.

232+, for gain or volume control means.

233, for volume control means combined with other control means.

255+, for local oscillator frequency control systems.

256, for frequency control combined with other control means which other means may be tuning or wave selection control.

266, for selectivity control wherein the frequency bandwidth is controlled for any desired carrier wave received.

353, for remote control means controlling a plurality of conditions from a remote position.

SEE OR SEARCH CLASS:

334, Tuners, appropriate subclasses for tuners, per se, which may be combined with other control means mechanically.

**201 Exalted carrier:**

This subclass is indented under subclass 130. Subject matter relating to a receiver system adapted to derive an output voltage representative of useful information modulated upon a carrier wave and comprising means whereby the carrier component is separated from the sideband or bands, amplified and recombined with the sideband or bands for the purpose of preventing the effects of selective fading or for obtaining a relatively undistorted output.

SEE OR SEARCH THIS CLASS, SUBCLASS:

296, for receiver systems in general having noise or other interference elimination.

SEE OR SEARCH CLASS:

329, Demodulators, subclass 358 for a synchronous amplitude demodulator.

**202 Suppressed carrier:**

This subclass is indented under subclass 130. Subject matter relating to a receiver system adapted to derive an output voltage representa-

tive of useful information modulated upon a carrier wave in the form of amplitude modulation, the carrier portion of the resultant wave being reduced in amplitude at the transmitter with only one or both of the sideband signals being transmitted to the receiver.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

46, for transmitter and receiver systems of the suppressed carrier type.

SEE OR SEARCH CLASS:

375, Pulse or Digital Communications, subclass 270 for transmitter and receiver systems with suppressed carrier; subclass 301 for transmitters with suppressed carrier and subclass 321 for receivers with suppressed carrier.

### 203 **Carrier and single sideband:**

This subclass is indented under subclass 130. Subject matter relating to a receiver system adapted to derive an output voltage representative of useful information being transmitted by means of the carrier and one sideband only.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

47, for transmitter and receiver systems of the single sideband type.

SEE OR SEARCH CLASS:

375, Pulse or Digital Communications, subclass 270 for transmitter and receiver systems with single sideband; subclass 301 for single sideband transmitters and subclass 321 for single sideband receivers.

### 204 **Vestigial sideband:**

This subclass is indented under subclass 130. Subject matter relating to a receiver system adapted to derive an output voltage representative of useful information modulated upon a carrier wave, the information having been transmitted via a signal comprising a carrier and one normal sideband the other sideband having been largely but not completely suppressed.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

47, for transmitter and receiver vestigial sideband systems.

SEE OR SEARCH CLASS:

348, Television, subclasses 725+ for TV receivers which may include vestigial sideband.

375, Pulse or Digital Communications, subclass 270 for transmitter and receiver pulse systems with vestigial sideband; subclass 301 for vestigial sideband pulse transmitters and subclass 321 for vestigial sideband pulse receivers.

### 205 **Frequency or phase modulation:**

This subclass is indented under subclass 130. Subject matter comprising a receiver system designed to convert a frequency-modulated or phase-modulated carrier wave input into perceptible output signals representative of the useful information contained in the modulation signal.

(1) Note. The basic elements of receivers included in this and the indented subclasses includes an input means (e.g., an antenna or converter means, intermediate frequency amplifier means, limiter means, frequency or phase discriminator and/or demodulator means, low (e.g., audio) frequency amplifier means and utilization means such as a loud speaker.

(2) Note. The subject matter found in this and the indented subclasses ordinarily will not include a frequency or phase modulation receiver by name only (i.e., recited as in a frequency modulation receiver, etc.) followed by specific details of an otherwise classifiable system which is not limited by its function to use in a frequency or phase modulation receiver. However, where the disclosure relates to such a frequency or phase modulation receiver and the receiver is included by name only followed by specifically claimed subject matter which is peculiar to such type a receiver, classification will be herein.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 23, for frequency modulation-type radio repeater systems.
- 42+, for spaced transmitter and receiver systems of the frequency or phase modulation type.
- 110+, for frequency or phase modulated transmitters, per se.

SEE OR SEARCH CLASS:

- 178, Telegraphy, subclasses 66.1+ for frequency shift telegraph receivers.
- 324, Electricity: Measuring and Testing, subclasses 76.39+ for frequency comparison or testing devices; and subclasses 76.77+ for phase comparison means.
- 329, Demodulators, subclasses 315+ for a frequency demodulator and subclasses 345+ for a phase demodulator.
- 332, Modulators, subclasses 117+ and 144+ for frequency or phase modulator, per se.
- 340, Communications: Electrical, subclasses 870.18+ for frequency or phase modulated telemetry systems; and subclasses 825.70 and 825.71+ for phase and frequency responsive selective systems.
- 343, Communications: Radio Wave Antennas, subclass 17.5 for frequency or phase modulation radar systems; subclasses 100+ for directional receivers utilizing a frequency modulated input.
- 358, Facsimile and Static Presentation Processing, subclasses 400+ for facsimile systems which may utilize frequency modulation.
- 370, Multiplex Communications, subclass 215 for multiplex phase modulation, and subclass 483 for multiplex frequency or angle modulation.
- 375, Pulse or Digital Communications, subclasses 271+, 302+, and 322+, for frequency or phase modulated carrier wave pulse or digital communications.

**206 Responsive to one of overlapping signals:**  
This subclass is indented under subclass 205. Subject matter in which the receiver has means by which a desired signal is detected regardless of the pressure of an overlapping signal, whether stronger or weaker.

**207 With plural conversion:**  
This subclass is indented under subclass 205. Subject matter including a plurality of mixing or conversion means.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 102, for transmitters with plural stages of modulation.
- 314, for receivers in general with wave modifying or conversion systems including plural successive conversion stages.

SEE OR SEARCH CLASS:

- 332, Modulators, subclasses 119+ and 145 for phase or frequency modulators having plural successive stages of modulation.

**208 With synchronized or controlled local oscillator:**  
This subclass is indented under subclass 205. Subject matter including means whereby the operating frequency of a local oscillator device is maintained in synchronism with a reference frequency, is maintained constant or is varied in accordance with a variation of the frequency of an input signal or means whereby some other operating condition of the local oscillator is controlled.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 196, for signal selection based on frequency (e.g., tuning) means combined with local oscillator tuning means.
- 255, for automatic frequency control or synchronization systems for receivers in general.
- 316, for frequency modifying or conversion means combined with plural local oscillator means and provided with frequency stabilization means for at least one local oscillator.

502+, for plural spaced transmitter and receiver systems with synchronization means.

SEE OR SEARCH CLASS:

329, Demodulators, subclasses 323+ and 346 for combining locally generated oscillations with a frequency modulated or phase modulated signal respectively.

331, Oscillators, subclasses 1+ for automatic frequency stabilization of an oscillator or oscillators utilizing phase or frequency sensing means.

**209 Plural local oscillators or mixers:**

This subclass is indented under subclass 208. Subject matter where there is more than one local oscillator or mixer in the receiver.

**210 With carrier amplitude modulation elimination (e.g., specified limiter):**

This subclass is indented under subclass 205. Subject matter in which the receiver system includes means for the elimination of amplitude modulation components of the input carrier wave signal.

- (1) Note. The amplitude modulation component of the input signal wave may arise from any source external to the receiver but most generally arises at the output of the transmitter.

SEE OR SEARCH THIS CLASS, SUBCLASS:

43, for spaced transmitter and receiver systems of the frequency or phase-modulated type with preemphasis or other predistortion network.

SEE OR SEARCH CLASS:

329, Demodulators, subclasses 318+ for reduction of amplitude variation in a frequency demodulator.

332, Modulators, subclass 18 for modulators with means to remove undesired amplitude modulation.

**211 Combined with other function:**

This subclass is indented under subclass 210. Subject matter where the tube or circuit which performs the carrier amplitude modulation

elimination also performs another function, for example, amplification.

**212 With squelch or other audio output silencing:**

This subclass is indented under subclass 205. Subject matter wherein the receiver system includes means whereby the receiver is prevented from producing audio-frequency output in the total absence of an input signal or in the absence of a predetermined signal-noise ratio relationship.

- (1) Note. The squelch means may be operated by signal energy in the receiver pass band, by noise quieting means, by a combination of the two, or means to prevent undesired variations in the output of the i.f., amplifier from causing a response in the output of the demodulator.

- (2) Note. The amplitude limiting means found in this subclass is intended to ensure that the amplitude variations in the modulated wave input to the demodulator are an accurate representation of frequency modulation of the input exclusive of noise or other undesired effects and are not to be confused with the amplitude modulation elimination means found in subclasses 210+.

- (3) Note. To complete the field of search for receivers in general utilizing muting or squelching means consult subclass 218.

- (4) Note. The squelch means may be operated by an externally generated signal having special modulation characteristics; such systems are classified in subclasses 701-703.

**213 Using specified filter:**

This subclass is indented under subclass 212. Subject matter in which the squelch or silencing action, or its reverse, is determined by a frequency discriminating means, specifically recited.

- (1) Note. The filter means may be high, low, or band pass or reject.

## SEE OR SEARCH CLASS:

327, Miscellaneous Active Electrical Non-linear Devices, Circuits, and Systems, subclasses 552+ for miscellaneous unwanted signal suppression utilizing an active filter.

**214 With particular discriminator or detector:**

This subclass is indented under subclass 205. Subject matter in which the system includes the combination of a frequency or phase-modulation type receiver, which may be broadly claimed, with a specific discriminator or detector means.

- (1) Note. For similar subject matter consisting of discriminator means combined with receiver means other than a frequency or phase modulation type receiver the search will be elsewhere in this class, and for frequency or phase discriminator, per se, the search will be elsewhere
- (2) Note. For purposes of classification in this subclass the words discriminator and detector are used synonymously and refer to the final means whereby amplitude variations are derived in response to the frequency or phase properties of a signal. The subject matter to be found here is not to be confused with heterodyning or mixing means which is sometimes referred to as the first detector of a receiver. Heterodyning or mixing means will be found in this class (455) subclass 313 and the indented subclasses.

## SEE OR SEARCH CLASS:

329, Demodulators, subclasses 315+ for frequency discriminators, and 345+ for phase discriminator. See the definition and search notes in Class 329 for the complete field of search in other related classes and for a statement of the dividing line between the subject matter in that and other related classes.

**215 Superregenerative:**

This subclass is indented under subclass 214. Subject matter wherein the particular discriminator or detector means is of the superregenerative type.

- (1) Note. Superregenerative detector means as such are specifically excluded from the Demodulator Detector Class 329 by the class definition of that class. Such detectors will be found in this class (455) subclasses 323+ below, if the device acts as a conversion means whose output is an intermediate frequency wave to be further acted upon by further states in a receiver circuit, and in subclasses 336+ if the output actually represents the information contained in the modulation signal.

**216 With particular frequency division or multiplication:**

This subclass is indented under subclass 205. Subject matter including the combination of a frequency or phase-modulation type receiver, which may be broadly claimed, with a specific frequency dividing or multiplying means.

## SEE OR SEARCH CLASS:

- 327, Miscellaneous Active Electrical Non-linear Devices, Circuits, and Systems, subclasses 113+ for miscellaneous frequency conversion or control and subclasses 185+ for stable state circuits which may be utilized as frequency dividers.
- 331, Oscillators, subclass 51 for frequency dividing, and subclass 53 for frequency multiplying, plural, cascaded oscillators; and subclasses 74+ for systems comprising a free running oscillator combined with particular output coupling network means which may comprise frequency multiplying or dividing means.
- 377, Electrical Pulse Counters, Pulse Dividers, or Shift Registers: Circuits and Systems, for electrical pulse counters and dividers.

**217 With protection circuit for receiver circuit:**  
This subclass is indented under subclass 130. Subject matter wherein the receiver system is provided with means to protect the entire receiver circuit or elements thereof from damage due to outside electrical influences.

- (1) Note. The subject matter found in this subclass will include only devices intended to protect the receiver system from damage from outside sources, such as lightning, overload due to an excessive signal and may consist of means placed in the antenna or collector input circuit, or means incorporated in the receiver circuit itself.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 117+, for transmitters with circuit protective means.  
347+, for mechanical protective means.

SEE OR SEARCH CLASS:

- 330, Amplifiers, subclass 51 for amplifiers combined with automatic disabling switch means.  
331, Oscillators, subclass 62 for oscillators with circuit protective means.  
343, Communications: Radio Wave Antennas, subclasses 6+ for radar systems which are provided with means, usually a T-R switch for receiver protection; for preventing damage to the receiver due to direct radiation from the transmitter.  
361, Electricity: Electrical Systems and Devices, subclasses 112 and 113 for safety and protective systems for electrical devices and equipment, for space discharge means and tuned circuit, respectively.  
454, Ventilation, subclass 184 for means for ventilating an enclosed space, such as a radio or a television cabinet.

**218 Squelch:**  
This subclass is indented under subclass 130. Subject matter where the receiver gain is automatically reduced (quieted) in response to a specified characteristic of the input signal.

- (1) Note. The specified characteristic is usually a lack of carrier wave or the presence of excessive noise.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 212+, for frequency or phase modulation receivers with squelch.

**219 With automatic gain or volume control:**  
This subclass is indented under subclass 218. Subject matter combined with control of the amplification of the receiver without manual intervention.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 234.1+, for automatic gain or volume control.

**220 Adjustable:**  
This subclass is indented under subclass 218. Subject matter where the level of input signal characteristic at which the squelch will operate is operator variable.

**221 Audio responsive:**  
This subclass is indented under subclass 218. Subject matter where the level of input signal characteristic at which the squelch will operate is operator variable.

**222 Noise controlled:**  
This subclass is indented under subclass 218. Subject matter in which the specified characteristic of the input signal is the presence of an unwanted or spurious signal at the input of the receiver which modifies the wanted signal.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 296+, for noise elimination in general.

**223 Short duration (noise blankers):**  
This subclass is indented under subclass 222. Subject matter where, in response to a noise pulse, the receiver output is squelched for a time period that is relatively short compared to the period of the demodulated signal.

**224 Separate broadband detector channel:**  
This subclass is indented under subclass 223. Subject matter where there is a separate signal path from the receiver input to the detector

which has a broader frequency response than a signal path from the receiver input to the squelch circuit.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

303+, for receivers with noise elimination having plural signal paths.

**225 Plural paths:**

This subclass is indented under subclass 218. Subject matter where the received signal is applied to two or more signal paths.

**226.1 Measuring or testing of receiver:**

This subclass is indented under subclass 130. Subject matter comprising means which, in use, determines qualitatively or quantitatively, a receiver characteristic.

- (1) Note. The receiver may not be operative as to communication during test, and the receiver is usually a block and claimed at least nominally.

SEE OR SEARCH CLASS:

250, Radiant Energy, subclass 250 for measuring the wavelength or frequency of radio and microwave.

331, Oscillators, appropriate subclasses for specific elements (e.g., noise generator), with no more than means for coupling to a receiver.

343, Communications: Radio Wave Antennas, subclass 703 for measuring of a signal with an antenna and a nominal receiver or with quantitative means.

**226.2 Signal strength:**

This subclass is indented under subclass 226.1. Subject matter including a means for measuring a signal strength level.

SEE OR SEARCH CLASS:

324, Electricity: Measuring, and Testing, subclasses 76+ for measuring, testing, or sensing electricity, per se.

**226.3 Signal-to-noise ratio:**

This subclass is indented under subclass 226.1. Subject matter including a means for determining a signal-to-noise ratio.

**226.4 With meter or indicator:**

This subclass is indented under subclass 226.1. Subject matter including a means for displaying to a human observer information concerning the receiver characteristics being measured.

**227 Responsive to an input signal of particular predetermined frequency:**

This subclass is indented under subclass 130. Subject matter wherein the receiver is permanently adjusted in such a manner as to have a response to signals having a carrier wave of a predetermined frequency or a carrier signal having a predetermined identifying modulation frequency superimposed thereon.

- (1) Note. The subject matter found in this subclass is restricted to receivers responsive to a particular preselected input activating signal of a predetermined frequency or other preselected characteristic only.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

26+, for unauthorized use prevention systems whereby only a particular receiver means is enabled to receive a message transmitted from the transmitter.

140, for a plurality of receivers selectively activated.

229, for receivers with alarm or alerting means.

352+, for remotely controlled receivers.

SEE OR SEARCH CLASS:

307, Electrical Transmission or Interconnection Systems, subclass 129 for frequency responsive switching systems.

327, Miscellaneous Active Electrical Non-linear Devices, Circuits, and Systems, subclasses 1+ for miscellaneous discriminating circuits and particularly subclasses 39+ for frequency discriminating.

333, Wave Transmission Lines and Networks, subclasses 165 through 212 for wave filters, per se, comprised of passive elements.

340, Communications: Electrical, subclasses 7.2 through 7.63 for selective paging devices, subclasses 539.1-

- 539.32 for automatic alarm systems operated via radio link, and subclasses 825.71-825.76 for frequency responsive remote control signal devices.
- 343, Communications: Radio Wave Antennas, subclasses 5+ for object detection systems responsive to returned signals; and subclasses 113+ for direction finding receiver systems responsive to a particular input signal.
- 346, Recorders, subclass 37 for recording systems with control means of the radio receiver type.
- 361, Electricity: Electrical Systems and Devices, subclasses 182+ for electric control circuits for relays which are frequency responsive.
- 375, Pulse or Digital Communications, subclasses 316+ for pulse receivers which may be selectively responsive.
- 380, Cryptography, appropriate subclasses for cryptographic prevention of signal unauthorized use.
- 228 Responsive to specified modulation (e.g., call alarm, conelrad):**  
This subclass is indented under subclass 227. Subject matter including means for indicating a predetermined modulation in the carrier.
- (1) Note. Systems with a two-state indicator such as an alarm light off or on or with a filter passbanding a warning tone, are classified here only if combined with an analog carrier wave communication receiver.
- (2) Note. Selective systems responsive to a predetermined signal(s) are classified in Class 340, subclasses 147+.
- SEE OR SEARCH CLASS:**
- 340, Communications: Electrical, subclasses 539.1 through 539.32 for an alarm system with a radio link.
- 343, Communications: Radio Wave Antennas, subclasses 100+ for directive receivers.
- 229 Responsive to carrier absence or presence:**  
This subclass is indented under subclass 227. Subject matter including means for indicating the absence or presence of the carrier in a receiver.
- (1) Note. The responsive means may energize an alarm or two-state device.
- (2) Note. Systems for indicating carrier level or strength, or for indicating tuning, are classified in subclass 154.
- 230 Local control of receiver operation:**  
This subclass is indented under subclass 130. Subject matter including provision for controlling an operating characteristic of the receiver.
- (1) Note. The control may be automatic or manual.
- (2) Note. Remote control is excluded from this subclass and will be found in subclasses 352+.
- 231 Applied at or for specific intervals or periods of time:**  
This subclass is indented under subclass 230. Subject matter including means whereby the control voltage or signal is applied to the receiver at or for specific intervals or periods of time.
- (1) Note. The time interval determining means may include electrical time constant circuits, mechanical means, or electron tube means.
- SEE OR SEARCH CLASS:**
- 178, Telegraphy, appropriate subclasses for telegraph receivers combined with control means which may be activated at or for particular time intervals.
- 200, Electricity: Circuit Makers and Breakers, subclasses 35+ for clock actuated switching means.
- 307, Electrical Transmission or Interconnection Systems, subclasses 141+ for time delay or retarded switching systems.
- 318, Electricity: Motive Power Systems, subclasses 443+ for means for periodically, repetitiously, or successively activating a motor control means; and subclasses 445+ for automatic or time delay means in a motor control circuit.

- 327, Miscellaneous Active Electrical Non-linear Devices, Circuits, and Systems, subclasses 261+ for miscellaneous output waveform production delay and subclasses 518+ for miscellaneous control circuits.
- 330, Amplifiers, subclass 9 for amplifiers with periodic switching of the input.
- 334, Tuners, appropriate subclass for clock controlled tuners, per se.
- 340, Communications: Electrical, subclasses 309.16 through 309.9 for timer controlled systems.
- 343, Communications: Radio Wave Antennas, subclass 113 for direction finding receivers which may have time controlling means.
- 368, Horology: Time Measuring Systems or Devices, subclasses 89+ for time-piece time interval measurement, per se.
- 369, Dynamic Information Storage or Retrieval, subclasses 6+ for combined radio and phonograph systems.
- 370, Multiplex Communications, appropriate subclasses for time division multiplex.

**232.1 Gain control:**

This subclass is indented under subclass 230. Subject matter wherein the operating characteristic is the ratio of the output of an amplifier to its input.

- (1) Note. The subject matter included in this and the indented subclasses will include patents relating to either signal gain or signal volume control combined with a receiver system since the terms are used more or less synonymously in the art.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 136, and 138, for plural separate receivers with output control means.
- 206+, for automatic volume control means.
- 210, for frequency or phase modulation type receivers with output limiting means.
- 254, for means to maintain specified signals-to-noise ratio (i.e., sensitivity control).

SEE OR SEARCH CLASS:

- 375, Pulse or Digital Communications, subclass 345 for pulse receivers with automatic amplitude control.

**233.1 With diverse control (tone, etc.):**

This subclass is indented under subclass 232.1. Subject matter including significantly claimed details of gain control means combined with other control means (e.g., tone control).

- (1) Note. To complete the field of search in this class for subject matter found in this subclass, further search must be made in the appropriate subclass relating to the particular other control mean. For example, wherein the other control means comprises frequency control, further search subclasses 255+, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 177.1, for receivers with manual selection means combined with other control means.
- 256, for receivers with frequency control means combined with other control means.

**234.1 Automatic:**

This subclass is indented under subclass 232.1. Subject matter comprising means for automatically controlling the gain as a function of some characteristic of the received carrier wave (e.g., signal amplitude) or some other conditions.

- (1) Note. For information as to the field of search for similar subject matter outside this class, see "SEARCH CLASS", under subclass 232.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 205, for frequency or phase-type receivers with automatic gain or volume control.

SEE OR SEARCH CLASS:

- 375, Pulse or Digital Communications, subclass 345 for pulse-type receivers with automatic gain or volume control.

- 234.2 Processor controlled:**  
This subclass is indented under subclass 234.1. Subject matter wherein the automatic means includes a programmable controller.
- 235.1 Forward acting:**  
This subclass is indented under subclass 234.1. Subject matter wherein the automatic gain acts on a stage subsequent to a detector stage.
- 236.1 Variable conversion efficiency (variable oscillator amplitude, etc.):**  
This subclass is indented under subclass 234.1. Subject matter wherein the receiver is a super heterodyne receiver with a frequency converter wherein the ratio of the output to the input of the frequency converter is variable.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
311, for noise or the interference elimination means in converter circuit.  
313+, for frequency modifiers or converters.
- 237.1 Responsive to locally injected pilot:**  
This subclass is indented under subclass 234.1. Subject matter wherein the other condition is responsive to a changing amplitude of a local reference signal via the amplifier stages.
- 238.1 Responsive to vehicle speed:**  
This subclass is indented under subclass 234.1. Subject matter wherein the other condition is responsive to the speed of a vehicle.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
297, for noise or other interference elimination in a vehicle receiver.  
345+, for receivers combined with vehicles.
- 239.1 Nonlinear automatic gain control:**  
This subclass is indented under subclass 234.1. Subject matter wherein the output of the amplifier does not rise or fall in direct proportion to the input.
- 240.1 Variable automatic gain control loop gain:**  
This subclass is indented under subclass 239.1. Subject matter wherein the ratio of the output to the input of the amplifier is controlled by an automatic gain control circuit containing a closed signal path (loop) having variable gain.
- 241.1 Different gain stages:**  
This subclass is indented under subclass 239.1. Subject matter wherein the receiver contains plurality of amplifiers, the gain of each amplifier being different.
- 242.1 Delayed:**  
This subclass is indented under subclass 239.1. Subject matter including a means to delay the output with respect to the input.
- 242.2 Different delays for different signal stages or thresholds:**  
This subclass is indented under subclass 242.1. Subject matter wherein the delay means is responsive to the input signal level of the amplifier or to the signal level in another amplifier.
- 243.1 Radio frequency stage only delayed:**  
This subclass is indented under subclass 242.1. Subject matter wherein only the automatic gain control of the radio frequency stages of the receiver is delayed.
- 244.1 Dual time constant:**  
This subclass is indented under subclass 239.1. Subject matter having two different periods of time to maximize the time response related to the carrier wave (e.g., fast response for a high carrier frequency and slow response for a low carrier frequency).
- 245.1 Automatic gain control signal derived from information signal:**  
This subclass is indented under subclass 234.1. Subject matter wherein the gain control is derived from the demodulated (usually the audio) signal.
- 245.2 Plural stages controlled:**  
This subclass is indented under subclass 245.1. Subject matter wherein the automatic gain control signal controls at least two or more stages.
- 246.1 Responsive to plural inputs:**  
This subclass is indented under subclass 234.1. Subject matter wherein the gain control signal is responsive to more than one signal characteristic or other condition.

**247.1 Separate automatic gain control signals:**  
This subclass is indented under subclass 246.1. Subject matter wherein there are two or more different automatic output signals.

**248.1 Constant or controlled input impedance:**  
This subclass is indented under subclass 234.1. Subject matter wherein the automatic gain control means varies or keeps constant the input impedance of the receiver.

**249.1 Variable attenuator type:**  
This subclass is indented under subclass 234.1. Subject matter comprising a circuit that absorbs part of the received carrier wave and transmits the remainder with a minimum of distortion or delay, the amount absorbed being variable.

**250.1 Automatic gain control to improve strong signal handling:**  
This subclass is indented under subclass 234.1. Subject matter wherein automatic gain control is used to prevent the receiver from becoming overloaded by a strong received signal.

**251.1 Plural stages with different levels or bias to each stage (e.g., partial automatic gain control):**  
This subclass is indented under subclass 234.1. Subject matter wherein there are a plurality of stages in the receiver who have their gain automatically controlled by the application to said stages of different bias or gain control signal levels.

**252.1 Semiconductor:**  
This subclass is indented under subclass 234.1. Subject matter having at least one semiconductor device (e.g., transistor, integrated circuit, etc.).

**253.1 Plural stages controlled with plates, screen grids, or cathodes connected in parallel:**  
This subclass is indented under subclass 234.1. Subject matter wherein the receiver has a plurality of stages which have vacuum tubes which have plates, cathodes, or screen grids connected in parallel to an automatic gain, level, or volume control voltage.

**253.2 Plural amplifier stages:**  
This subclass is indented under subclass 234.1. Subject matter including two or more gain stages.

**254 Sensitivity control:**  
This subclass is indented under subclass 230. Subject matter including significant means whereby the input signal to a receiver system is controlled in such a manner as to produce a predetermined specified output signal having a specified signal to noise ratio.

SEE OR SEARCH THIS CLASS, SUBCLASS:

232.1, for gain, level, or volume control systems.

SEE OR SEARCH CLASS:

343, Communications: Radio Wave Antennas, subclasses 5+ for radar systems including receivers which may include sensitivity control; and subclasses 100+ for directive systems which may include sensitivity control.

**255 Local oscillator frequency control:**  
This subclass is indented under subclass 230. Subject matter including one or more local oscillators combined with means to adjust the generated frequency thereof or with a control circuit or loop for controlling the oscillator frequency adjusting means in response to deviation of the generated oscillator frequency from a desired frequency or range of frequencies in such direction and amount as to restore the oscillator frequency to the desired frequency or range of frequencies.

(1) Note. The control circuit or loop includes: (a) discriminator means for sensing the deviation of the generated frequency of the oscillator, or oscillators, in direction and amount and for producing control energy proportional to such deviation, and (b) means responsive to the control energy and coupled to frequency adjusting means of the oscillator, or oscillators, to the desired frequency or range of frequencies whereby the intermediate frequency output of a mixer means, to which the output of the oscillator, or oscillators, is applied will remain

constant at a given frequency or range of frequencies.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 147, for panoramic type receivers with local oscillator control means.
- 196.1+, for wave selection (i.e., tuning) means combined with local oscillator tuning means.
- 208+, for phase or frequency modulation type receivers with synchronized or controlled local oscillator means.
- 226, for measuring, testing, or calibrating apparatus for receivers which may include oscillator control means.
- 316, for wave or modifying or conversion systems with frequency stabilization means for at least one local oscillator.

SEE OR SEARCH CLASS:

- 332, Modulators, subclasses 123+ for controlling an average condition of a frequency modulator and subclasses 155+ and 161+ for controlling an average condition of an amplitude modulator.

**256 Combined with other control:**

This subclass is indented under subclass 255. Subject matter including significantly claimed details of frequency control means (as defined in subclass 255) combined with other control means (e.g., tone control, selectivity control) or other broadly included control means which may be included by the name only (e.g., volume control).

- (1) Note. To complete the field of search for subject matter found in further search must be made in subclasses, or classes, relating to other control means. For example, if the other control means comprises selectivity control the further search should be in subclass 266, etc.

**257 Automatic:**

This subclass is indented under subclass 255. Subject matter wherein the control means consists of a self-acting control circuit or loop whereby the output frequency of the oscillator means or the output of the mixer means is maintained constant at a desired frequency or within a desired frequency range. The control

circuit or loop generally includes discriminator means for sensing the deviation of the oscillator output frequency in direction and amount with means for producing a control energy corresponding to the sensed deviation and applying the generated control energy to a controlling means in the oscillator circuit in the proper sense or direction to restore the oscillator output frequency to a desired value.

- (1) Note. Systems wherein the frequency deviation of the output of the conversion means (i.e., intermediate frequency) is sensed and a control energy applied in such a direction as to compensate for the deviation are also found here.

SEE OR SEARCH CLASS:

- 331, Oscillators, subclasses 1+ for similar subject matter relating to oscillator systems of general utility having automatic frequency stabilization means. See Lines With Other Classes and Within That Class, and References to Other Classes, in the class definition of Class 331 and the search notes under subclass 1 of that class.

**258 Utilizing particular local oscillator control:**

This subclass is indented under subclass 257. Subject matter including automatic frequency control means broadly included with significantly recited details of one or more particular elements within the control circuit whereby the frequency, control of the oscillator is stabilized or adjusted in response to a deviation from the desired frequency.

SEE OR SEARCH CLASS:

- 331, Oscillators, subclasses 1+ for oscillators in general having automatic frequency stabilization means, particularly subclass 8 for transistorized controls; subclasses 10+ for plural controls; and subclasses 34+ for particular-type frequency control means.

**259 Reference oscillator or source:**

This subclass is indented under subclass 258. Subject matter wherein the control means comprises a reference oscillator or source.

- SEE OR SEARCH CLASS:  
331, Oscillators, particularly subclasses 18+ for automatic frequency stabilized oscillators with reference oscillator or source.
- 260 Phase lock loop or frequency synthesizer:**  
This subclass is indented under subclass 259. Subject matter having either a closed-loop electronic servomechanism the output of which locks onto or tracks the reference signal or a frequency source of high accuracy whose output frequency, is composed of two components.
- 261 Variable reactance (e.g., reactance tube):**  
This subclass is indented under subclass 258. Systems wherein the control means comprises variable reactance means. The variable reactance means may consist of a reactance tube or a solid-state type variable reactance means, e.g., in the oscillator circuit, the reactance of which is a function of applied bias voltage.
- SEE OR SEARCH CLASS:  
331, Oscillators, subclass 36 for automatic frequency stabilized oscillators with particular frequency control reactance device.
- 262 Voltage controlled capacitor:**  
This subclass is indented under subclass 261. Subject matter in which the variable reactance is a device whose capacitance varies in accordance with a control voltage applied to the device.
- 263 Discriminator or detector:**  
This subclass is indented under subclass 258. Subject matter wherein the control means comprises a device in which amplitude variations are derived in response to frequency or phase variations.
- SEE OR SEARCH CLASS:  
329, Demodulators, appropriate subclasses for demodulators, per se.  
331, Oscillators, particularly subclasses 3, 9, 25+, and 32+ for automatic frequency stabilized oscillators with discriminator means.
- 264 Voltage control of oscillator:**  
This subclass is indented under subclass 258. Subject matter having an oscillator the frequency of which can be varied by a changing voltage.
- 265 With local oscillator synchronization or locking:**  
This subclass is indented under subclass 257. Subject matter including means whereby a predetermined phase or frequency relationship is maintained between the output of at least one local oscillator and a standard or synchronizing source or wherein the frequency of one or both of two oscillating systems which are coupled together are shifted and automatically held in such a relationship that the two frequencies have the ratio of two integral numbers.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
208+, for frequency or phase modulation type receivers with synchronized or controlled local oscillator means.  
502+, for complete systems comprising plural transmitters and/or receivers with synchronizing means.
- SEE OR SEARCH CLASS:  
331, Oscillators, for synchronized oscillators; subclasses 18+ for automatic frequency control type; subclass 55 for plural oscillators; subclass 145 for multivibrators; subclass 149 for blocking oscillators; and subclass 172 for oscillators of general utility and having synchronizing means.  
375, Pulse or Digital Communications, subclasses 354+ for synchronizing systems which may utilize oscillators of the automatic frequency stabilized type.
- 266 Selectivity or bandwidth control:**  
This subclass is indented under subclass 230. Subject matter including significant means for controlling the extent to which the receiver is capable of differentiating between a desired signal and disturbances of the other frequencies or whereby the difference between the limiting frequencies of a band of frequencies over which the receiver is operative may be varied.

SEE OR SEARCH THIS CLASS, SUBCLASS:

193.1, and 289, for systems comprising the combination of receiver systems with input wave selection means.

SEE OR SEARCH CLASS:

327, Miscellaneous Active Electrical Non-linear Devices, Circuits, and Systems, subclasses 39+ for miscellaneous frequency comparing, selecting, or detecting circuits.

333, Wave Transmission Lines and Networks, subclasses 167+ for passive wave filters which may be of the adjustable bandwidth type, especially subclasses 177+ for transformer coupled type (e.g., intermediate frequency transformers).

334, Tuners, particularly subclass 40 for tuners with sensitivity or "Q" adjustment means.

**267 Tone control:**

This subclass is indented under subclass 230. Subject matter including significant details of means whereby a part of the frequency range of the low frequency signals in an audio frequency amplifier of a receiver is emphasized or attenuated to produce a desired bass or treble effect thereby obtaining a quality more pleasing to the ear of a listener when the signals are reproduced.

- (1) Note. Where the claimed subject matter comprises significant details of some specific control means other than tone control with tone control means claimed broadly, classification will be in the appropriate subclass for such other control means with an official cross-reference in this subclass.

SEE OR SEARCH CLASS:

84, Music, subclass 622 for electronic musical instruments with tone generation and/or control of tone partials.

330, Amplifiers, appropriate subclasses for amplifiers with equalizing or tone control networks.

333, Wave Transmission Lines and Networks, subclasses 28+ for equalizing networks of the passive type including

tone controls which vary the signal attenuation characteristics over a range of frequencies.

**268 Fidelity control:**

This subclass is indented under subclass 230. Subject matter including significant means for controlling the degree to which a signal transmission system, consisting of a receiver system, reproduces at its output the essential characteristics of a signal impressed upon the input.

- (1) Note. Systems which involve nothing more than noise elimination or control means will not be found in this subclass but, unless claimed as part of a more comprehensive system, will be classified in subclasses 296+.
- (2) Note. For complete information as to the extent of the field of search for similar subject matter in other classes, see "SEARCH CLASS", under subclass 254.

SEE OR SEARCH THIS CLASS, SUBCLASS:

267, for receivers with tone control means.

**269 With wave collector (e.g., antenna):**

This subclass is indented under subclass 130. Subject matter wherein the receiver includes wave collecting or antenna means combined with the whole or a specific part of a receiver system and wherein the claimed combination does not form a subcombination of a more comprehensive otherwise classifiable systems.

- (1) Note. For purposes of classification in this class the word collector is generic to antenna and includes, in addition to antennas, such devices as inductive pickup coils and other devices intended to supply radio frequency or carrier wave energy to the input of a receiver. In this and the indented subclasses the collector system will include the antenna or coil along with the connecting circuitry up to the input terminals of a pre-selector, radio frequency amplifier or mixer means which forms the first stage of a receiver.

- (2) Note. An antenna or collector means as defined in this class will include a physical device in the form of a metallic current conductor, waveguide, or space discharge device in direct engagement with free space and whereby an electromagnetic energy wave or a wave travelling in restricted space.
- (3) Note. Nominal recitation of antenna, or of "antenna circuit" plus specifics of an indent below is sufficient to classify herein.
- (4) Note. The combination of significant antenna structure and significant radio structure is classified herein. However, where detailed antenna structure is combined with nominally recited radio structure, classification is in Class 343, subclasses 700+. For example, such terms as transmitter, receiver, and signal source are considered nominal recitations of radio structure.

## SEE OR SEARCH CLASS:

- 178, Telegraphy, subclass 43 for space induction telegraphy systems.
- 191, Electricity: Transmission to Vehicles, for means for transmitting electrical energy between relatively moving parts, one of which may be a movable antenna, and particularly subclass 10 for magnetic induction systems; subclasses 12.2+ where a reel is involved; and subclasses 22+ where a conductor presenting a substantially continuous exposed surface along the path of movement for contact with a collector is involved.
- 246, Railway Switches and Signals, subclasses 8, 63, and 194 for inductive signalling systems which may involve inductive coupling devices similar to loop antennas; and subclass 30 for Hertzian wave systems involving antennas. See also the reference to Class 246 under section VIII of the class definition of Class 343.
- 250, Radiant Energy, subclass 250 for radio and microwave meters which may include an antenna or probe as an element of the combination.
- 315, Electric Lamp and Discharge Devices: Systems, subclass 34 for the structural combination of an electric discharge device and an antenna integrally united.
- 318, Electricity: Motive Power Systems, subclass 16 for electric motors controlled by space transmitted electromagnetic wave energy (e.g., by radio) or electrostatic energy.
- 324, Electricity: Measuring and Testing, appropriate subclass for electrical testing methods and apparatus that may include the use of radio waves, induction fields, or electric fields.
- 332, Modulators, subclass 174 for absorption type amplitude modulators which may include a directive antenna.
- 343, Communications: Radio Wave Antennas, subclasses 5+ for radar systems which may include an antenna; subclasses 100+ for directive systems including beacons and direction finding receivers utilizing; and subclasses 700+ for miscellaneous significant antenna systems and structure, particularly subclass 702 for antenna combined with a radio cabinet; subclass 703 for antenna combined with means for measuring the signal received; and subclass 711 for antenna combined with a vehicle. See also the definitions and search notes of subclasses 700+ for the field of search for other apparatus or systems utilizing antennas or means for supporting and orienting antennas.
- 348, Television, appropriate subclasses for television systems that may include radio wave antennas.
- 358, Facsimile and Static Presentation Processing, appropriate subclasses for facsimile systems that may include radio wave antennas.

**270 Power-line or receiver element used as wave collector:**

This subclass is indented under subclass 269. Subject matter wherein a portion of a power-line, or a specified receiver element, is used as the formal wave collector.

- (1) Note. Receiver elements such as the power transformer, an external structure or the speaker leads may be used.
- (2) Note. Systems using “carrier current” communication along a power-line are classified in Class 340, subclasses 310.11+ and 538+.
- 271 Suppression of radiation from receiver via wave collector:**  
This subclass is indented under subclass 269. Subject matter wherein a circuit is provided in the coupling, or in the receiver, for the purpose of reducing emission from the collector.
- (1) Note. For a structural means (shielding) which may have the same purpose, see subclass 300.
- 272 Plural separate collectors:**  
This subclass is indented under subclass 269. Subject matter in which there are two or more separate and distinct collecting means combined with a single receiving system.
- SEE OR SEARCH CLASS:  
343, Communications: Radio Wave Antennas, subclasses 725+ for plural separate diverse type antennas; subclasses 729+ for plural diverse type antennas using the same active element; subclasses 776+ for plural waveguide type antennas; subclass 844 for plural antennas spaced a fractional or full wavelength apart (e.g., diversity); subclass 869 for plural loop antennas; subclass 879 for support means for plural antennas; and subclass 893 for plural antennas in general.
- 370, Multiplex Communications, appropriate subclasses for systems which may employ plural antenna to receive a plurality of messages or carriers (i.e., multiplex).
- 273 With particular output combining:**  
This subclass is indented under subclass 272. Subject matter including significant details relating to particular combining means in the output circuit of the antennas or collectors and in which the single input to the receiver is a resultant function of the combination in some manner the various outputs of a plurality of separate collectors or antennas.
- SEE OR SEARCH CLASS:  
343, Communications: Radio Wave Antennas, subclasses 725+ for plural antennas with impedance matching or coupling networks.
- 274 Loop or coil antenna:**  
This subclass is indented under subclass 273. Subject matter where at least one of the collectors consists of one or more loops of wire.
- (1) Note. The loops of wire may be wound around a core of magnetic material or a form made of insulating material or may be self-supporting.
- 275 With frequency changing or selecting in the output path of one or more collectors:**  
This subclass is indented under subclass 272. Subject matter including specific details relating to frequency changing or fixed frequency selecting in the output path of at least one or more of the plurality of separate antennas or collectors and not comprising an integral part of the receiver proper.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
193.1, for signal selection based on frequency with antenna circuit tuning.  
289, for coupling varying, regulating, or control.  
313+, for frequency modifying or conversion.
- 276.1 With phase shifting, correcting, or regulating in the output path of one or more collectors:**  
This subclass is indented under subclass 272. Subject matter including specific details relating to phase shifting and/or regulating means in the output path of at least one or more of the plurality of separate antennas or collectors.
- SEE OR SEARCH CLASS:  
323, Electricity: Power Supply or Regulation Systems, subclasses 212 through 219 for electrical systems (i.e., power frequency systems) wherein a single electrical source circuit is coupled to a

single electrical lead circuit and including means whereby the phase angle between the current or voltage of either or both of said circuits is automatically controlled.

- 324, Electricity: Measuring and Testing, subclasses 76.77+ for systems for measuring, testing, or sensing electricity, per se, by phase comparison.
- 327, Miscellaneous Active Electrical Non-linear Devices, Circuits, and Systems, subclasses 141+ for miscellaneous synchronizing circuits and subclasses 231+ for miscellaneous phase shift circuits.
- 333, Wave Transmission Lines and Networks, subclasses 100+ for branched circuits that may include passive type equalizing or phase delay networks; subclass 18 for automatically controlled equalizer or phase control networks of the passive type; and subclasses 138+ for passive type wave equalizers, per se.

**277.1 Selectively or alternately connected to receiver:**

This subclass is indented under subclass 272. Subject matter including a means to connect any one of the plurality of antennas to the single receiving system.

**SEE OR SEARCH CLASS:**

- 343, Communications: Radio Wave Antennas, subclass 725 for plural diverse type antenna structures which may be selectively employed; subclass 742 for a plurality of high frequency loop type antennas; subclass 777 for a plurality of waveguide antennas with switching means; and appropriate other subclasses for particular types of plural antennas which may be selectively utilized.

**277.2 By signal quality (e.g., noise):**

This subclass is indented under subclass 277.1. Subject matter wherein the means is responsive to a signal noise.

**278.1 Combined with noise or interference elimination:**

This subclass is indented under subclass 272. Subject matter including noise or interference elimination combined with or in the output circuit of at least one of the plurality collectors.

- (1) Note. The claimed noise or interference elimination found in this subclass will be combined with or in the output path of at least one of a plurality of claimed antenna, collector device, or antenna circuit and generally consist of static or other noise elimination but may comprise correction for fading or other interfering signals.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

- 283, for noise reduction or elimination in the output circuit of a single claimed antenna or collector means.
- 296, for noise or interference reduction or elimination means within or comprising an integral part of the receiver circuitry or structure.

**SEE OR SEARCH CLASS:**

- 343, Communications: Radio Wave Antennas, subclasses 850+ for antenna structure with coupling network or impedance in the lead-in which may include noise or static suppression means, particularly subclass 851 for such networks with radiation suppressor.

**279.1 Plural antenna currents entering single transformer:**

This subclass is indented under subclass 278.1. Subject matter wherein one transformer is used in coupling the collectors to the receiver.

**280 With coupling to a stage of the receiver:**

This subclass is indented under subclass 269. Subject matter including wave collector and a receiver stage coupled by a specified coupling means.

- (1) Note. For purposes of classification in this class a tuned circuit connected between the grid and cathode of a tube and variably tunable will be considered

as a preselector stage and not a part of the collector coupling circuit. Subject matter relating to preselector circuit means will be found in this class (455) subclass 193.1.

- (2) Note. The word detector as defined in this and the indented subclasses will refer to a demodulator means and is not to be confused with mixer means sometimes referred to in the patent literature as a first detector with the demodulator being referred to as a second detector. In this and other subclasses in this class the word detector when used will always denote the demodulator or second detector means. Note that prior to the advent of the heterodyne type of receiver the antenna was usually connected directly to a radio frequency amplifier-detector means or detector means along with the output connected directly to some utilization means such as headphones.
- (3) Note. Class 329, Demodulators, contains some demodulators combined with other elements such as an amplifier or speaker. The search notes to that class under the general class definition list combinations considered as classifiable in Class 329 and elsewhere. It will be noted that this Class is specifically mentioned as the proper place for "radio receivers generally including combinations of antennas and detectors or demodulators" and superheterodyne detectors (i.e., mixers).
- (4) Note. As an example of the difference between subject matter to be found in this and indented subclasses and that to be found in this class under signal selection based on frequency, subclasses 150.1+ let it be assumed (a) that the system claimed or disclosed consists of a collector circuit including the primary of an inductive transformer, one terminal of which is connected to ground and the other in a closed loop including the collector, or (b) a tunable circuit including the secondary of the input transformer and an amplifier having the tunable circuit connected between the grid and cathode thereof. For classification pur-

poses in this subclass the collector loop circuit including the primary winding of the transformer (a) will be considered as a particular coupling circuit (i.e., transformer) between the collector and amplifier and will be found in subclass 292. The tunable circuit in the input of the tube means which also includes a winding of the transformer (i.e., secondary) (b) will be considered as a wave selecting means in combination with an amplifier means and will be found in subclasses 150+.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

- 129+, for transmitters with coupled antenna.  
 214+, for frequency or phase modulation receivers with particular discriminator.  
 313+, for receiver including particular wave conversion or mixer means.  
 337, for receiver including particular discriminator means.  
 341+, for receiver including particular amplifier means.

**SEE OR SEARCH CLASS:**

- 178, Telegraphy, subclass 2 for miscellaneous telegraphy systems which may comprise an antenna combined with detector or amplifier means.  
 315, Electric Lamp and Discharge Devices: Systems, subclass 34 for electric lamp and discharge lead devices having an antenna combined therewith as a unitary structure and not otherwise classifiable.  
 329, Demodulators, appropriate subclasses for demodulator systems, per se.  
 330, Amplifiers, appropriate subclasses for amplifiers, per se.  
 331, Oscillators, subclasses 37+ for beat frequency oscillator, per se.  
 332, Modulators, appropriate subclasses for modulators, per se.  
 343, Communications: Radio Wave Antennas, appropriate subclasses for radar, receivers consisting of an antenna combined with detector or other means. Search also subclasses 850+ for antenna structure combined with a coupling network or impedance

in the leading. The leading is defined in the definition of Class 343 as being, "a conductive means for conveying the signal energy between the active antenna and the signal source or receiver.

**281 Having distributed parameters:**

This subclass is indented under subclass 280. Subject matter wherein the coupling means is a system whose constants, such as a resistance, inductance or capacitance, cannot be considered as concentrated at any one point in space.

**SEE OR SEARCH CLASS:**

- 333, Wave Transmission Lines and Networks, appropriate subclasses.  
361, Electricity: Electrical Systems and Devices, subclasses 297+ for printed circuits structure.

**282 Transmission line:**

This subclass is indented under subclass 281. Subject matter wherein the coupling means comprises a transmission line.

- (1) Note. The transmission line may be a lumped element artificial line, coaxial, shielded, or other configuration such as a Lecher wire.

**SEE OR SEARCH CLASS:**

- 333, Wave Transmission Lines and Networks, subclasses 24+ for coupling networks consisting of passive elements and having long line characteristics; subclasses 236+ for long lines in general; and subclasses 245+ for long line elements and components.  
343, Communications: Radio Wave Antennas, subclass 905 for antenna structure combined with long line elements.

**283 Undesired signal or noise control (e.g., anti-static):**

This subclass is indented under subclass 280. Subject matter in which the coupling means acts to reduce signals or noise from the frequency spectrum of the desired signal.

- (1) Note. For purposes of classification in this and subsequent subclasses any undesired signal or electrical disturbance

within the useful frequency band will be considered to be noise and any unwanted and random noise caused by atmospheric conditions or electric or electrostatic discharges originating from other sources external of and influencing the collector will be considered as static. For systems comprising means, within the receiver circuit, for prevention, reduction, or elimination of noise and/or other interference search will be in this class (455), subclasses 296+ below.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

- 278.1, for plural antennas for a single receiver with noise or interference suppressing means.  
296, for similar systems wherein the collector is not claimed. See (1) Note above.

**SEE OR SEARCH CLASS:**

- 174, Electricity: Conductors and Insulators, subclasses 32+ for anti-inductive structures.  
307, Electrical Transmission or Interconnection Systems, subclasses 89+ for anti-induction or coupling means for prevention of inductive coupling to other circuits; and subclass 93 for surge, transient, or parasitic current suppression means.  
333, Wave Transmission Lines and Networks, subclass 12 for wave transmission line inductive or radiation interference reduction systems.  
343, Communications: Radio Wave Antennas, appropriate subclasses for antenna structure combined with impedance means in the leadin which may serve as interference attenuation means, particularly subclass 851 for antenna combined with coupling network having radiation suppressing means.

**284 Balancing or cancelling:**

This subclass is indented under subclass 283. Subject matter including significant means for producing a balancing or neutralizing current or voltage of opposite phase and equal intensity to that resulting from the unwanted signal

whereby the unwanted signal is suppressed at the input to the receiver.

**285 With image frequency suppression:**  
This subclass is indented under subclass 283. Subject matter wherein the coupling includes means whereby an unwanted signal appearing at the collector and whose frequency differs from the received signal by twice the intermediate frequency, is suppressed or eliminated.

- (1) Note. For similar structure not tuned specifically to the superheterodyne image frequency refer to subclass 286 in a noise reducing system, and subclass 290 for general wave collector coupling systems using tuned circuits.

SEE OR SEARCH THIS CLASS, SUBCLASS:  
302, for image frequency suppression in general.

**286 Wave filter, coil or wave trap:**  
This subclass is indented under subclass 283. Subject matter including means whereby undesired signals differing in frequency from the desired signal are absorbed and thus prevented from appearing at the input terminals of the receiver.

SEE OR SEARCH THIS CLASS, SUBCLASS:  
193.1, for receivers having tuned antenna coupling means in general.  
287, for similar means comprising a shunt or bypass.  
307, for receivers in general with filter means for reduction of the effects of noise or other interference.

SEE OR SEARCH CLASS:  
333, Wave Transmission Lines and Networks, subclasses 24+ for coupling networks consisting of passive element devices; and subclasses 165-212 for passive element wave filters.

**287 Shunt or bypass:**  
This subclass is indented under subclass 283. Subject matter including means whereby any undesired signal or signals are shunted or bypassed to ground and thus prevented from appearing at the input terminals of the receiver.

SEE OR SEARCH THIS CLASS, SUBCLASS:

285, and 286, for similar means comprising a resonant circuit or filter in a noise reduction system.

**288 Particular composition (e.g., of cell or element):**

This subclass is indented under subclass 283. Subject matter wherein the significant noise and/or static reduction or elimination means comprises an element utilizing a material or composition which conducts or varies its impedance selectively so as to attenuate the noise or static energy and permit message of the desired signal without attenuation.

SEE OR SEARCH CLASS:  
257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), appropriate subclasses for specific active solid-state devices which show nonlinear behavior.

**289 With coupling varying, regulating, or control:**

This subclass is indented under subclass 280. Subject matter wherein the coupling means includes means whereby the reaction of the antenna or collector output circuit upon the receiver input circuit of the receiver is varied, maintained constant, or controlled by design to react over the frequency range in a desired way.

- (1) Note. An example of the subject matter to be found in this subclass is an antenna connected to the input of a receiver through a variometer.
- (2) Note. The systems to be found here are variable tuned circuits in the antenna or collector-receiver coupling circuits and are not intended to be utilized as pre-selector or tuning means for the receiver. For wave selecting (i.e., tuning), search this class (455), for subclass 193.1.

SEE OR SEARCH CLASS:  
343, Communications: Radio Wave Antennas, subclasses 854 and 861 for adjustable antenna coupling means.

**290 Including passive tuned circuit:**  
This subclass is indented under subclass 280. Subject matter where the coupling is a fixed tuned circuit.

- (1) Note. The systems to be found here comprise tuned circuit means in the antenna or collector receiver coupling circuits and are not intended to be utilized as preselector or tuning means for the receiver but often times are utilized to determine the frequency of the signal accepted by the antenna or collector and transmitted to the receiver input terminals. For wave selecting (i.e., tuning) circuits utilized for the determination of the frequency to which a receiver is tuned, search this class (455), subclass 193.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 283+, for receivers using tuned circuits in the antenna coupling for undesired signal or noise control.  
289, for receivers with variable tuned circuits in antenna coupling systems.  
340, for receivers using variable resonant or tuned circuits in coupling systems.

**291 Using active device (e.g., as preamplifier or reactance):**

This subclass is indented under subclass 280. Subject matter wherein the coupling means includes an electron tube device, solid state device, transistor, diode, or other active device whereby the magnitude of the high frequency signal applied to the receiver may be maintained constant or other wise influenced.

- (1) Note. The coupling means may act merely as a resistive impedance in the coupling circuit, or may act as an amplifier.

SEE OR SEARCH CLASS:

- 327, Miscellaneous Active Electrical Non-linear Devices, Circuits, and Systems, for miscellaneous nonlinear circuits utilizing active devices.  
330, Amplifiers, appropriate subclasses for amplifiers.

**292 Transformer or other passive inductance:**  
This subclass is indented under subclass 280. Subject matter wherein the coupling means includes at least the primary winding of a transformer or other inductive means.

- (1) Note. For purposes of Classification in this subclass the primary winding of an input transformer, the secondary winding of which, along with a capacitor or other tuning means constitutes the wave selecting or tuning means in the input of a receiver, will be considered to be in the coupling circuit and will be found in subclasses 289 and 290.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 284, 285, 286, and 287, (note also) where inductances may be used in noise reducing coupling circuits.  
289, where variometers and variable inductances are classified.  
290, where tuned circuits using inductances are classified.

SEE OR SEARCH CLASS:

- 343, Communications: Radio Wave Antennas, subclasses 745+ for antenna structure combined with variable reactance for tuning the antenna; subclasses 749+ for antenna structure combined with lumped reactance for leading the antenna; and subclasses 850+ for antenna structure combined with impedance means in the leadin.

**293 Specified stage (e.g., mixer, amplifier, or demodulator):**

This subclass is indented under subclass 280. Subject matter wherein the coupling means is connected to at least a named stage of the receiver.

**294 With particular electron tube structure:**

This subclass is indented under subclass 293. Subject matter in which the stage has an electron or other charged particle space discharge device or devices characterized by special tube construction or electrode arrangement combined with sufficient circuitry to define the assembly as a system such as is excluded from

the other subclasses in this class and related other art devices classified elsewhere.

- (1) Note. The circuitry means to be found in this subclass consists of the circuitry comprising that associated with the tube itself and is not to be confused with the coupling means between the collector and the tube input found in the subclasses above this class.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 193.1, where there is a tunable circuit between the collector and the tube input.  
291, wherein the electron tube constitutes a coupling impedance or amplifier between collector and receiver input.

SEE OR SEARCH CLASS:

- 313, Electric Lamp and Discharge Devices, appropriate subclasses for all lamp and discharge devices, per se, where significant lamp or discharge device structure only is claimed, combined with means for modifying the temperature of the lamp or discharge device, and with separate casing, jacket, shield, enclosure, or envelope protecting means.  
315, Electric Lamp and Discharge Devices: Systems, appropriate subclasses for discharge devices of various types combined with circuitry for controlling the tube and in which no load for the tube is claimed.  
327, Miscellaneous Active Electrical Non-linear Devices, Circuits, and Systems, particularly subclasses 598+ for miscellaneous electron tube devices characterized by special tube construction or electrode arrangement combined with sufficient circuitry to control the tube or provide an output from the tube and not otherwise classifiable.  
329, Demodulators, appropriate subclasses for various electron tube devices used as demodulators and not combined with sufficient structure as to define a complete receiver.  
330, Amplifiers, appropriate subclasses for various electron tube devices used as amplifiers and not forming a part of

more comprehensive system classifiable elsewhere.

- 331, Oscillators, appropriate subclasses for various electron tube devices combined with sufficient circuitry to constitute a free running oscillator system and not forming a subcombination of a more comprehensive system classified elsewhere.

**295 Modulation distortion or cross talk correction or elimination:**

This subclass is indented under subclass 130. Subject matter including means whereby intermodulation components occurring in a desired modulated carrier wave input signal, due to cross-modulation of the desired carrier by an undesired signal wave, are corrected for or whereby distortions of a desired modulated carrier wave input signal, which are due to causes other than interference external to the receiver system, are corrected for or eliminated.

- (1) Note. Some examples of the various sources of distortion are selective fading, attenuation in the transmitting medium, cross-talk, etc.

**296 Noise or interference elimination:**

This subclass is indented under subclass 130. Subject matter having structure to (a) suppress the influence of extraneous electric or magnetic fields upon receiver circuitry, (b) prevent radiation of undesired electric or magnetic fields from the receiver circuitry, or (c) prevent translation through, or suppress at some point in, the receiver system any undesired modulation components accompanying a desired modulation carrier wave input signal which components are due to electrical disturbances within the useful frequency band or any undesired carrier wave, which may originate at a source external to the receiver wave input or collection means and arrive at the input or collector simultaneously with the desired modulated carrier wave.

- (1) Note. The extraneous fields or undesired components may be due to external sources or internally generated noises or disturbances due to microphonica or regenerative effects.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 63.1 through 65, for complete systems with noise prevention.
- 175.1+, for frequency selection (tuning) means combined with muting means.
- 219, for volume control systems combined with noise squelch means.
- 278.1+, for plural antennas with noise elimination means connected to a receiver.
- 283+, for subject matter relating to noise or static reduction or eliminating means within the coupling circuit between a collector (antenna) means and the input terminals of a receiver.
- 295+, for receivers with signal intermodulation or cross talk correction or elimination means.
- 298+, for receivers with hum or interaction prevention means in the power or bias supply.
- 317+, for frequency modifying or conversion systems including means for the prevention of unwanted oscillations.
- 501+, for complete systems comprising a plurality of transmitters or receivers with noise reduction.

SEE OR SEARCH CLASS:

- 327, Miscellaneous Active Electrical Non-linear Devices, Circuits, and Systems, subclasses 310+ for transient reduction by limiting or clipping, subclasses 379+ for miscellaneous reduction of gating noise, and subclasses 551+ for miscellaneous unwanted signal suppression.
- 330, Amplifiers, appropriate subclasses for amplifiers with limiting means.
- 340, Communications: Electrical, subclass 600 for systems for detecting a signal bearing useful information accompanied by noise.
- 343, Communications: Radio Wave Antennas, subclasses 5+ for object detection radar systems having noise or interference prevention means; and subclasses 100+ for directive radio wave receivers which may have interference prevention means.
- 348, Television, subclasses 607+ for noise elimination in television systems.

- 370, Multiplex Communications, appropriate subclasses for multiplex systems having interference suppression.
- 375, Pulse or Digital Communications, subclass 285 for complete systems utilizing pulse modulation and having distortion or noise prevention means; and subclasses 346+ for pulse type receivers with interference or noise reduction means.

**297 In vehicle:**

This subclass is indented under subclass 296. Subject matter wherein the receiver is located in self-propelled movable conveyance.

- (1) Note. For purposes of classification in this class, aircraft, land vehicles, and water craft are all considered to be vehicles under the general meaning of the word.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 11.1+, for mobile radio repeater stations.
- 95, for mobile or portable transmitters.

SEE OR SEARCH CLASS:

- 343, Communications: Radio Wave Antennas, subclasses 705+ for antennas combined with aircraft; and subclasses 711+ for antennas combined with other vehicle.

**298 Originating in power supply:**

This subclass is indented under subclass 296. Subject matter where the noise or other interference arises in the receiver power supply.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 343.1 through 343.6, for receiver power supplies in general.

**299 Filter or rectification in power supply energized by fluctuating or A. C. source:**

This subclass is indented under subclass 298. Subject matter having means to smooth or integrate the current or voltage of energization before application thereof to the signal processing components, the energizing circuit also having means to make the voltage or current unidirectional (i.e., D.C.) prior to application to

such smoothing or integrating means, if necessary.

**300 By shielding:**

This subclass is indented under subclass 296. Subject matter wherein the field suppression structure is a field-resistant body interposed between the field source and the region in which the suppression is desired.

- (1) Note. The body is generally an enclosure containing the receiver or a portion thereof.

**301 Plural or compartmented shielding structure:**

This subclass is indented under subclass 300. Subject matter wherein the shielding structure shields plural elements of the receiver by either (a) including plural shielding devices, or (b) including compartments in a single device.

**302 Image frequency suppression:**

This subclass is indented under subclass 296. Subject matter comprising the combination of frequency modifying or conversion means with significant details of means whereby an unwanted signal appearing at the output of the conversion means, and whose frequency differs from the desired signal by twice the intermediate frequency, is suppressed or eliminated.

**303 Using plural separate signal paths:**

This subclass is indented under subclass 296. Subject matter comprising means for receiving a modulated carrier input signal wave consisting of a plurality of signal translating channels including at least one main channel, which one channel includes means for selecting a carrier component having a first characteristic type of modulation representing a desired signal as well as a second type of modulation representing undesired signal disturbances, and at least one other auxiliary signal translating channel comprising means for selectively detecting only modulation representing undesired signal disturbances and means responsive to the output of both channels to reduce or cancel the effects of the undesirable signal disturbances.

SEE OR SEARCH CLASS:

375, Pulse or Digital Communications, subclass 349 for a signal receiver with a noise or interference reduction circuit comprising plural signal paths.

**304 Phase shift in at least one path:**

This subclass is indented under subclass 303. Subject matter wherein at least one of the separate signal paths includes phase shifting or delaying.

SEE OR SEARCH CLASS:

333, Wave Transmission Lines and Networks, subclasses 138+ for passive phase delay networks, per se.

**305 With balancing or neutralizing:**

This subclass is indented under subclass 303. Subject matter in which the outputs of the plural separate paths are combined in such a manner as to balance out or neutralize the modulation representing the undesired signal disturbances.

SEE OR SEARCH THIS CLASS, SUBCLASS:

283, for receivers with particular noise or static balancing or neutralizing means coupled between the antenna and receiver.

**306 Filter in at least one path:**

This subclass is indented under subclass 305. Subject matter where at least one signal path offers comparatively little opposition to certain frequencies or to direct current, while blocking or attenuating other frequencies.

**307 With specific filter structure:**

This subclass is indented under subclass 296. Subject matter which offers comparatively little opposition to certain frequencies or direct current while blocking or attenuating other frequencies.

**308 With amplitude limiter:**

This subclass is indented under subclass 296. Subject matter wherein the noise or interference reduction means includes diode or other amplitude limiting means.

**309 In demodulator or low frequency (audio amplifier circuit):**

This subclass is indented under subclass 308. Subject matter wherein the diode or other amplitude limiting means is a part of or associated with the demodulator or audio frequency circuits of the receiver.

**SEE OR SEARCH CLASS:**

329, Demodulators, particularly subclasses 321 and 350 for amplitude limiting in a frequency or amplitude demodulator respectively.

**310 Internally generated noise or oscillations:**

This subclass is indented under subclass 296. Subject matter where the noise or other interference that is eliminated is noise or oscillations which arise from the receiver's own circuitry (except power supply).

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

298+, for elimination of noise arising in the receivers power supply.

**311 In radio frequency amplifier, intermediate frequency amplifier or converter circuit:**

This subclass is indented under subclass 296. Subject matter in which the noise or interference reduction means forms an integral part of or is associated with the circuitry of the radio frequency amplifier, frequency converter, intermediate frequency amplifiers of the receiver stages or the coupling circuit between any two of the three stages.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

307, for noise or interference reduction means comprising filter means. The filter means may be located anywhere in the system and may consist of either a single filter or a plurality of filters.

**312 In demodulator or low frequency (e.g., audio frequency) amplifier circuit:**

This subclass is indented under subclass 296. Subject matter wherein the noise or interference reduction means forms an integral part of or is electrically associated with the circuitry of the demodulator or the low frequency (e.g.,

audio frequency) amplifier stages of the receiver.

**313 Frequency modifying or conversion:**

This subclass is indented under subclass 130. Subject matter including means whereby a modulated carrier wave signal is changed to another carrier frequency, e.g., an intermediate frequency signal, the frequency of which lies between that of the modulated input signal and the frequency of the lower frequency modulating signal.

- (1) Note. In this and the indented subclasses the frequency conversion is usually accomplished by combining a modulated carrier wave input signal with the output of a local oscillator means (i.e., by mixer means).

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

196.1+, for variation of local oscillator frequency combined with signal frequency selection.

255+, for local oscillator frequency control.

**SEE OR SEARCH CLASS:**

307, Electrical Transmission or Interconnection Systems, subclass 424 for nonoptical parametric amplifier frequency converters, per se.

324, Electricity: Measuring and Testing, subclass 76.41 for systems for measuring, testing, or sensing of electricity by heterodyning; and subclass 85 for phase comparison systems utilizing frequency conversion.

327, Miscellaneous Active Electrical Non-linear Devices, Circuits, and Systems, subclasses 113+ for miscellaneous frequency conversion or control.

331, Oscillators, subclasses 37+ for beat frequency oscillators.

332, Modulators, appropriate subclasses for modulators in general.

343, Communications: Radio Wave Antennas, subclasses 6+ for radar receivers which may utilize frequency conversion means; and subclasses 100+ for directional receivers utilizing frequency converters.

- 348, Television, appropriate subclasses for television systems which may include frequency conversion.
- 359, Optics: Systems and Elements, subclasses 326+ for optical frequency translators.
- 370, Multiplex Communications, appropriate subclasses for multiplex systems which may include frequency conversion.
- 314 Plural separate successive conversions:**  
This subclass is indented under subclass 313. Subject matter comprising a plurality of separate frequency modifying or conversion means or stages, the modulated input wave being passed through the frequency conversion stages in succession.
- 315 With plural separate local oscillators:**  
This subclass is indented under subclass 314. Subject matter including separate local oscillator means combined with at least two or more of the plural separate conversion means.
- 316 With frequency stabilization for at least one local oscillator:**  
This subclass is indented under subclass 315. Subject matter including means whereby the output frequency of at least one of the plurality of separate local oscillator means is stabilized.
- 317 Unwanted oscillation or radiation prevention:**  
This subclass is indented under subclass 313. Subject matter including frequency modifying or conversion means combined with other means whereby any unwanted or parasitical oscillations originating in the receiver circuitry are eliminated or whereby any oscillations occurring in the receiver circuitry are prevented from being reradiated from the receiving antenna.
- SEE OR SEARCH CLASS:
- 174, Electricity: Conductors and Insulators, for electric shielding structures in general.
- 307, Electrical Transmission or Interconnection Systems, subclass 89 for anti-induction systems in general.
- 329, Demodulators, appropriate subclasses for demodulators having radiation reducing means.
- 343, Communications: Radio Wave Antennas, subclasses 5+ for radar receivers with reradiation prevention means; and subclasses 100+ for directive systems which may have radiation control.
- 318 With specified local oscillator structure or coupling:**  
This subclass is indented under subclass 313. Subject matter including significant details of either (a) at least one source of unmodulated signal for frequency conversion, or (b) circuitry connecting a source of unmodulated signal to a frequency conversion device.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 196.1+, for signal selection based on frequency including variation of local oscillator frequency.
- 255+, for control of local oscillator frequency.
- 319 With particular coupling:**  
This subclass is indented under subclass 318. Subject matter including significant details of circuitry whereby the output of the local oscillator means is coupled to the frequency modifying or conversion means.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 338, for subject matter relating to particular coupling means between stages of a receiver system.
- 320 Lumped impedance:**  
This subclass is indented under subclass 319. Systems where substantially all impedance in the coupling means is concentrated in components, as distinguished from impedance due to stray or distributed effects.
- 321 In a single envelope or with common active element (e.g., autodyne):**  
This subclass is indented under subclass 318. Subject matter wherein the frequency modifying or conversion means and the local oscillator means are enclosed in a single envelope.
- (1) Note. The combination of means may comprise: (a) a single triode or diode type tube structure with external cir-

cuitry whereby a local signal is generated and superposed on a modulated signal input, (b) two or more assemblies of electrodes to which the local signal and the modulated input signal are applied, (c) a single assembly of electrodes to some of which the local signal is applied and to others of which the modulated wave input is applied. One example of the subject matter to be found here is the autodyne system in which the same electron tube device constitutes both an oscillator and a mixer (1st detector).

SEE OR SEARCH CLASS:

- 327, Miscellaneous Active Electrical Non-linear Devices, Circuits, and Systems, subclass 591 for miscellaneous circuits where an electron tube performs plural functions.
- 329, Demodulators, subclasses 323+, 346 and 358+ for diverse types of demodulators using locally generated oscillations.
- 331, Oscillators, subclass 58 for oscillators performing plural functions simultaneously.

**322 Plural common electrode:**

This subclass is indented under subclass 321. Subject matter wherein the conversion means and local oscillator means are combined in a single electron tube having a plurality of separate control grids.

**323 Particular frequency conversion structure or circuitry:**

This subclass is indented under subclass 313. Subject matter including significant details of the frequency modifying or conversion means.

SEE OR SEARCH CLASS:

- 327, Miscellaneous Active Electrical Non-linear Devices, Circuits, and Systems, subclasses 113+ for miscellaneous frequency conversion or control.

**324 Homodyne (e.g., zero beat or synchrodyne reception):**

This subclass is indented under subclass 323. Subject matter comprising frequency conversion or modifying means and combined with means whereby a local signal wave of the same

frequency as the incoming modulated wave is injected therein (i.e., zero beat).

SEE OR SEARCH CLASS:

- 329, Demodulators, subclasses 323+, 346 and 358+ use of synchronized oscillations locally generated in a frequency, phase, or amplitude demodulator, respectively.

**325 Including distributed electrical parameter structure:**

This subclass is indented under subclass 323. Systems comprising frequency conversion means including significant structural elements of such dimensions that their distributed constants (e.g., inductance, capacitance, resistance, or conductance) must be taken into account.

- (1) Note. The distributed inductance or capacity may be either in the conversion device or associated circuitry.
- (2) Note. The subject matter found here generally consists of systems where the combination of a detecting element and structure having distributed electrical parameters and which system is restricted by disclosure or claims to mixers or converters. Where the combination is claimed generically with general detection use suggested in the specification, or with both mixer and detector use suggested in the specification, classification is in Class 329, subclasses 160+ or other appropriate subclasses.

SEE OR SEARCH CLASS:

- 329, Demodulators, subclasses 322 and 354 for distributed parameter structure in a frequency or amplitude demodulator, respectively.
- 330, Amplifiers, subclass 43 for travelling wave tube amplifiers; subclass 44 for electron beam tube amplifiers; subclass 47 for magnetron amplifiers; and subclass 49 for electron vacuum tube amplifiers with distributed electrical parameter elements.
- 331, Oscillators, appropriate subclasses for oscillators with distributed parameter resonator, particularly subclass 42 for beat frequency oscillators with cavity mixer.

- 332, Modulators, subclasses 129+ for distributed parameter structure in a frequency modulator and subclasses 163+ for distributed parameter structure in an amplitude modulator.
- 333, Wave Transmission Lines and Networks, appropriate subclasses for passive wave transmission networks of the distributed parameter type.
- 326 With balanced mixer:**  
This subclass is indented under subclass 325. Systems including two or more identical frequency conversion devices arranged in conjugate relationship about a neutral or grounded point, the output of the system comprising a linear combination of the separate input signals.
- (1) Note. The subject matter to be found here will include systems in which input signals are applied to the input of the mixer or conversion devices 180 apart, with the output signal being derived in additive relationship (i.e., push-pull).
- SEE OR SEARCH CLASS:  
332, Modulators, subclasses 154 and 180 for push-pull circuits in an amplitude modulator and subclass 172 for an amplitude modulator utilizing a bridge circuit.
- 327 Stripline:**  
This subclass is indented under subclass 326. Systems where the distributed electrical parameter structure is in the form of a thin, narrow rectangular strip adjacent to a wide ground-plane conductor or between two wide ground-plane conductors.
- 328 Hollow waveguide:**  
This subclass is indented under subclass 326. Subject matter in which the distributed electrical parameter structure is a transmission line comprising a hollow conducting tube.
- 329 Electron beam tube:**  
This subclass is indented under subclass 325. Subject matter wherein the frequency conversion means comprises electron beam tube means.
- SEE OR SEARCH CLASS:  
332, Modulators, appropriate subclasses for a pulse, frequency, phase or amplitude modulator utilizing electron beam tubes.
- 330 With nonlinear impedance (e.g., diode):**  
This subclass is indented under subclass 325. Subject matter having a device connected to the distributed electrical parameter structure, said device having an output that does not rise or fall in direction proportion to the input.
- 331 Crystal or electron tube diode:**  
This subclass is indented under subclass 323. Systems and in which the frequency conversion means consists of crystal or other type (e.g., electron tube) diode devices of the two terminal or electrode type. The diodes may be of passive rectifier type or active such as a negative resistance (e.g., tunnel or Esaki diode).
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
326+, for plural diode mixers forming a balanced mixer combined with distributed parameter structure.  
330+, for a diode mixer combined with nonlinear structure.  
333, for frequency converters of the semiconductor active element type having three or more terminals.
- SEE OR SEARCH CLASS:  
329, Demodulators, subclasses 203+ for demodulating devices consisting of diode or two electrode devices.  
332, Modulators, subclasses 139+ for piezoelectric devices in a frequency modulator, subclass 172 for an amplitude modulator having a bridge which may include a nonlinear device, and subclasses 176+ for a nonlinear device in an amplitude modulator.
- 332 Push-pull:**  
This subclass is indented under subclass 323. Systems wherein the frequency conversion means includes two paths for either the modulated input carrier wave or locally generated signal wave, or both, which have a common output, the two paths being connected electrically in parallel with respect to the input and

output of the paths the voltages in the two paths being 180 of phase with respect to each other.

SEE OR SEARCH CLASS:

- 329, Demodulators, appropriate subclasses for demodulators having balanced input.
- 330, Amplifiers, subclass 118 for push-pull amplifiers.
- 332, Modulators, subclasses 154 and 180 for push-pull circuits in an amplitude modulator.

**333 Transistor or integrated circuit:**

This subclass is indented under subclass 323. Systems wherein the frequency conversion means comprises an active element, three or more terminal device or devices constructed of a semiconductor material having a specific resistance, for example, of the order of that of germanium, silicon, selenium, etc. (e.g., transistor).

- (1) Note. For specific types of receivers which may include semiconductor devices, see the pertinent subclass relating to the particular special type receiver in this class.

SEE OR SEARCH CLASS:

- 257, Active Solid-State Devices (e.g., Transistors, Solid-State Diodes), appropriate subclasses integrated circuit structure with active solid-state devices, subclasses 446 and 499+ for integrated circuit devices with electrically isolated components, in general, and other appropriate subclasses for specific type devices in integrated circuits.
- 329, Demodulators, appropriate subclasses for demodulators using a discrete semiconductor device.
- 330, Amplifiers, subclasses 250+ for amplifiers with transistors.
- 331, Oscillators, subclasses 108+ for oscillators utilizing transistor type active element.
- 348, Television, subclasses 659+ for natural color television with mixing.

**334 With particular receiver circuit:**

This subclass is indented under subclass 130. Subject matter comprising subcombinations peculiarly adapted for use in a receiver system, and consisting of an electron tube or other active elements combined with particular electric circuit means in either the input or output thereof.

- (1) Note. This subclass and its indented subclasses provide for subject matter peculiar to and forming subcombinations of receiver apparatus which are not sufficiently comprehensively claimed for classification above in this class, but which claim sufficient significant structure to exclude the subject matter claimed from art classified elsewhere. See Search Notes under subclass 130.

**335 Plural diverse function tube or stage (performs plural functions alternately or concurrently):**

This subclass is indented under subclass 334. Subject matter including at least one electron space discharge device which is provided with circuit means for performing at least two independent functions either simultaneously or selectively.

**336 Superregenerative detector or discriminator:**

This subclass is indented under subclass 334. Subject matter comprising systems of the type where, in the detector, oscillations are alternately allowed to build up and are quenched at a frequency which is high compared with the modulation frequency.

- (1) Note. The quench voltage may be supplied either by the detector itself or it may be supplied separately by a separate quenching oscillator.
- (2) Note. The superregenerative devices found here are very similar to the detector or demodulator systems found in Class 329. However, the superregenerative systems have been excluded from that class since they are more in the nature of a combination of amplifier plus a first detector (i.e., mixer) in which the input comprises a modulated wave and

in which the output voltage representing the modulating signal. Therefore, even though the devices to be found here are often claimed as detectors, they are excluded from the detector Class 329 and, since this is the generic class for modulated carrier wave communication systems, they are to be classified here as wave frequency conversion devices. See section III under the class definition of Class 329 for a further understanding of the line of demarcation between the two as to this subject matter.

**337 Discriminator or demodulator:**

This subclass is indented under subclass 334. Systems including discriminator or demodulator means associated with sufficient significant circuitry so as to be limited to use in a receiver system.

- (1) Note. Some examples of subject matter to be found in this subclass are detector means in combination with antenna means and frequency discriminator means deriving an output other than the modulation signal, etc.

**SEE OR SEARCH CLASS:**

- 327, Miscellaneous Active Electrical Non-linear Devices, Circuits, and Systems, particularly subclasses 2+ for miscellaneous phase discrimination, subclasses 39+ for miscellaneous frequency discrimination, and subclasses 334+ for a miscellaneous circuit providing an output which is a nonlinear function of an input.
- 329, Demodulators, subclasses 315+, 345+ and 347+ for frequency, phase or amplitude demodulators, respectively. See also the Class Definition of Class 329 for additional relevant areas of search.

**338 Coupling or decoupling between stages:**

This subclass is indented under subclass 334. Systems including means whereby two or more stages or systems are electrically associated in such a manner that electrical effects in one produce similar effects in the other or networks are used to prevent interaction or coupling between two electric circuits.

**SEE OR SEARCH THIS CLASS, SUB-CLASS:**

- 280+, for receivers with particular coupling means between antenna and input circuit.
- 319+, for local oscillator with particular coupling.

**SEE OR SEARCH CLASS:**

- 330, Amplifiers, appropriate subclasses for amplifiers with coupling or decoupling means.
- 331, Oscillators, subclasses 74+ for oscillators with particular output coupling networks, per se, comprised of passive elements.
- 333, Wave Transmission Lines and Networks, subclasses 24+ for coupling networks, per se, comprised of passive elements.
- 336, Inductor Devices, appropriate subclasses for transformers adapted to be used as coupling means.

**339 Band pass filter:**

This subclass is indented under subclass 338. Systems wherein the coupling means comprises a band pass filter.

**SEE OR SEARCH CLASS:**

- 333, Wave Transmission Lines and Networks, subclasses 165 through 212 for wave filters comprised of passive elements.

**340 Variably tunable or adjustable:**

This subclass is indented under subclass 338. Systems wherein the coupling or decoupling means is recited as variably tunable or adjustable whereby the extent of the effective coupling or the width of the band passed by the network may be varied.

**SEE OR SEARCH THIS CLASS, SUB-CLASS:**

- 191, for band selection receivers with a plurality of tunable coupled tube stages.
- 266, for receivers with selectivity or bandwidth control means.
- 289, for variable coupling means between antenna and receiver.

**341 Amplifier:**

This subclass is indented under subclass 334. Systems including amplifier means associated with sufficient significant circuitry so as to be limited to use in a receiver system.

## SEE OR SEARCH CLASS:

- 329, Demodulators, appropriate subclasses for a demodulator with associated amplifier.
- 330, Amplifiers, appropriate subclasses for specific amplifiers, per se.

**342 Reflex type:**

This subclass is indented under subclass 341. Systems wherein the amplifier is of the reflex type wherein two signals of different frequencies are amplified in the same tube.

- (1) Note. Most reflex circuits amplify the two signals simultaneously. For example, the signal may be amplified once as an i-f signal before detection and again as an a-f signal after detection.
- (2) Note. See the discussion of amplifier means in combination with other peculiar to radio receivers, in a single tube, in Note XVII of the Search Notes to Class 330, Amplifiers, for the classification line between the subject matter in that class and that contained in this subclass.
- (3) Note. Systems comprising the combination of amplifier means with detector means and wherein the detector means is claimed in such a way as to comprise merely a feedback signal source from the output to the input of the amplifier or where the detector is claimed in broad terms and significant details of the amplifier are claimed, will be classified here. Systems comprising significantly claimed detector means combined with an amplifier means claimed in broad terms or as serving merely as an input signal source for the detector means will be classified in Class 329, Demodulators.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 335, for receivers having a tube or stage for performing plural functions simultaneously or selectively.

**343.1 Having particular powered or bias supply (including self-powered or battery saving means):**

This subclass is indented under subclass 334. Subject matter indented including significant detail of a source of electrical energy for supplying power to the elements of the receiver or for supplying biasing potential to the electrodes of the active elements comprising the elements of the receiver.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 117, for means for protecting a transmitter by controlling the power supply or bias voltage.
- 127.1 through 127.5, for transmitters with particular power or bias voltage supply.
- 230 through 268, for similar receiver circuits having means to control receiver operation.
- 298 through 299, for a power supply including means to prevent undesired signals therefrom.

SEE OR SEARCH CLASS:

- 327, Miscellaneous Active Electrical Non-linear Devices, Circuits, and Systems, subclasses 530 through 550 and SEARCH CLASS section thereunder for miscellaneous circuits having a specific source of supply or bias voltage.
- 329, Demodulators, appropriate subclasses for demodulators with power supply.

**343.2 Battery saving based on received signal:**

This subclass is indented under subclass 343.1. Subject matter wherein power conservation is controlled by an externally supplied signal to a receiver.

**343.3 Based on identification:**

This subclass is indented under subclass 343.2. Subject matter wherein an external signal des-

- ignates a particular receiver to perform power conservation.
- 343.4 Based on schedule information:**  
This subclass is indented under subclass 343.2. Subject matter wherein an external provides timing information relative to power conservation.
- 343.5 Battery saving based on detected power source level:**  
This subclass is indented under subclass 343.1. Subject matter wherein power conservation control is responsive to the present state of a power source.
- 343.6 Back-up power supply:**  
Subject matter indented under 343.1 wherein an alternate source of power may be substituted for a primary source of power.
- 344 Combined with diverse art device:**  
This subclass is indented under subclass 130. Subject matter wherein the receiver apparatus is combined with other devices or structures having an added purpose or independent utility other than to perfect the receiver, and in which the utility of the other art device is not destroyed or disturbed by the removal of the receiver and which combination is not provided for elsewhere.
- (1) Note. Where the other art device merely acts as a temporary support for a receiver and there is no special structural features which form a cooperating means between the other art device and the receiver classification will be elsewhere.
- SEE OR SEARCH CLASS:**
- 40, Card, Picture, or Sign Exhibiting, subclasses 455+ for changeable exhibitors with sound in which the source of the sound may be a receiver.
- 102, Ammunition and Explosives, subclass 214 for fuses utilizing radiant energy.
- 178, Telegraphy, subclasses 118+ for telegraph receivers which may be combined with other art devices.
- 194, Check-Actuated Control Mechanisms, appropriate subclasses for check controlled radio systems combined with other art devices.
- 248, Supports, subclasses 27.1+ for means for supporting an instrument in a panel.
- 307, Electrical Transmission or Interconnection Systems, subclasses 9.1+ for vehicle mounted systems in which the vehicle may provide power means for a radio telephone or other receiver means; and subclass 156 for miscellaneous systems with particular load device or load device combination.
- 312, Supports: Cabinet Structure, subclass 7.1 for radio type cabinets.
- 340, Communications: Electrical, subclass 6 for radar system combined with diverse radio wave systems or apparatus.
- 346, Recorders, subclass 37 for recorders combined with a radio receiver, responsive to the receiver tuning means and for the purpose of determining the listening habits of the users of a receiver.
- 361, Electricity: Electrical Systems and Devices, subclasses 182+ for single and plural relay circuits that are frequency responsive. The signal may be derived from the output of a receiver means.
- 362, Illumination, appropriate subclasses for combined light and structure.
- 369, Dynamic Information Storage or Retrieval, subclasses 6+ for combined radio and phonograph systems.
- 386, Television Signal Processing for Dynamic Recording or Reproducing, subclasses 1+ and 46+ for television combined with recorders.
- 396, Photography, subclass 434 for a camera combined with a radio.
- 446, Amusement Devices: Toys, subclasses 116+ for figure toys combined with sound in which the figure may act as a receptacle for a receiver.
- 345 With vehicle:**  
This subclass is indented under subclass 344. Subject matter wherein the diverse art device is a self-propelled movable conveyance in which the receiver is mounted.
- (1) Note. For purpose of classification in this class, aircraft, land vehicles, and water craft are all considered to be vehi-

cles under the general meaning of the word.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

- 11.1+, for mobile radio repeater stations.
- 95+, for mobile or portable transmitters.
- 152, for remote control of the tuning of a vehicle receiver.
- 297, for noise elimination or vehicle receiver.

**SEE OR SEARCH CLASS:**

- 343, Communications: Radio Wave Antennas, subclasses 705+ for antennas combined with aircraft; and subclasses 711+ for antennas combined with other vehicles.

**346 Detachable for portability:**

This subclass is indented under subclass 345. Subject matter wherein the cooperating means between the vehicle and receiver is operable to permit release of the receiver to operate in an easily carried, self-contained manner.

**347 Cabinet, housing, or chassis structure:**

This subclass is indented under subclass 130. Subject matter including structural details of an enclosure surrounding, or a framework supporting, the electrical components of the receiver.

- (1) Note. The cabinet structures in this and the indented subclasses must include specific structure of a receiver or an element thereof, otherwise such structure is classified as a cabinet, per se.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

- 66.1, for spaced transmitter and receiver systems combined with other art devices.
- 128, for transmitters with casing or housing.
- 344, for receivers combined with other art devices where the other art device may also furnish an enclosure or support for the receiver means.

**SEE OR SEARCH CLASS:**

- 174, Electricity: Conductors and Insulators, subclasses 50+ for boxes and housings limited by claimed structure to electrical use but having no characteristic limiting them to particular electrical equipment; and subclasses 250+ for printed circuit arrangements of general utility.
- 181, Acoustics, subclasses 148+ for a diaphragm mounted in a cabinet.
- 312, Supports: Cabinet Structure, subclass 7.1 for cabinets or enclosures especially designed to house radio apparatus absent electrical component structure; see (1) Note, above.
- 348, Television, subclasses 787+, 789, and 836+ for structural details of cabinet or chassis for television systems.
- 361, Electricity: Electrical Systems and Devices, subclasses 331+ for boxes and mountings in combination with electrical apparatus having no significant art limitation, or boxes and mounting in combination with plural diverse electrical apparatus, particularly subclass 101 for radio type components with housing or mounting means including modules.

**348 With retractable or readily detachable chassis:**

This subclass is indented under subclass 347. Subject matter wherein the structure includes means whereby a chassis structure is retractably, hingedly, or detachably supported within the cabinet structure.

**349 Sectional or interconnectable (e.g., modules):**

This subclass is indented under subclass 347. Subject matter wherein the receiver components are separately housed in separate containers or supported in groups or units each of the containers groups or units being separable from the others.

**SEE OR SEARCH CLASS:**

- 174, Electricity: Conductors and Insulators, subclasses 50+ for electrical boxes and housings; and subclasses 250+ for preformed panel circuit arrangements, per se.

- 361, Electricity: Electrical Systems and Devices, subclasses 380+ for radio-type electrical apparatus comprised of plural components with spacing or mounting means (e.g., modules and for switchboards and analogous devices utilizing printing circuitry.
- 439, Electrical Connectors, subclass 17 for detachable connectors comprising preformed panel circuit arrangement, e.g., printed circuit devices.
- 350 With particular speaker mounting:**  
This subclass is indented under subclass 347. Subject matter wherein there are details of a support for a speaker in the receiver.
- 351 Transportable:**  
This subclass is indented under subclass 347. Subject matter wherein the receiver is of such size and shape as to be readily carried by or supported by a person.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
11+, for portable repeaters.  
90.1 through 90.3, for portable transceiver.  
95+, for portable transmitters.
- SEE OR SEARCH CLASS:  
250, Radiant Energy, subclass 250 for radio and microwave frequency meters which may be portable.  
343, Communications: Radio Wave Antennas, subclasses 100+ for directive receiver systems comprising receivers which may be carried on the person; and subclass 718 for antennas adapted to be body attached or connected.
- 352 Remote control of receiver:**  
This subclass is indented under subclass 130. Subject matter wherein the operation of the receiver is controlled by at least one or more devices from a point geographically spaced from the receiver.
- (1) Note. The control system to be found in this and indented subclasses will include both means whereby the control function is performed electrically from a remote point over intervening wired or radio circuits and means whereby the control function is performed mechanically by mechanical means such as a Bowden wire or flexible shaft.
- (2) Note. The term geographically spaced means located at a distance of an order of magnitude comparable to, or greater than the receiver dimensions.
- (3) Note. Radio wave remote control of a receiver, per se, is classified herein. Radio wave remote control of an external device (e.g., garage door opener) is classified in Class 340, subclasses 694+.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
4.1+, for remote control of a distribution system.  
68+, for systems having a transmitter and a receiver at separate location with signal control.  
88, for a transceiver controlling a separate transceiver or receiver.  
92, for remote control of a transmitter.  
151.1, for receivers with remote control of channel or station selection (e.g., tuning).  
227+, for a receiver responsive to an input signal of a particular predetermined frequency which may be used to remotely control the receiver.  
345, for remote control of a vehicle receiver.
- SEE OR SEARCH CLASS:  
74, Machine Element or Mechanism, subclasses 10+ for shaft operators of the radio tuner type which may be remotely controlled.  
192, Clutches and Power-Stop Control, subclass .02 for electric motor control and clutch which may be utilized in radio receiver control means.  
200, Electricity: Circuit Makers and Breakers, appropriate subclasses for switch means, per se, particularly subclasses 35+ for clock controlled switching means.  
307, Electrical Transmission or Interconnection Systems, subclasses 116+ for condition responsive switching systems.

- 318, Electricity: Motive Power Systems, subclass 16 for electric motor control systems.
- 327, Miscellaneous Active Electrical Non-linear Devices, Circuits, and Systems, subclasses 518+ for miscellaneous control circuits.
- 329, Demodulators, appropriate subclasses for automatic control of a demodulator.
- 330, Amplifiers, subclasses 127+ for amplifier means combined with means to control the power supply or bias voltage.
- 331, Oscillators, subclasses 1+ for oscillators combined with automatic frequency stabilization means; subclasses 175+ for the frequency stabilization means; subclasses 177+ for frequency adjusting means; and subclasses 182+ for amplitude control or stabilization means for oscillators.
- 332, Modulators, appropriate subclasses for modulators combined with control means.
- 333, Wave Transmission Lines and Networks, appropriate subclasses for passive element networks with control means or having a controlling function. For example, subclass 16 for pilot current controlled networks; subclasses 17.1+ of automatically controlled networks; and subclass 81 for attenuators.
- 336, Inductor Devices, appropriate subclasses for transformers or inductive devices with controlling means.
- 338, Electrical Resistors, appropriate subclasses for electrical resistance elements with control means, particularly subclasses 68+ for mechanically variable resistors.
- 340, Communications: Electrical, subclasses 539.1 through 539.32 for an alarm system automatically responsive to a condition with a radio coupling link and subclasses 825.69 and 825.72 for remote control signaling or indicating systems.
- 343, Communications: Radio Wave Antennas, subclasses 5+ for radar systems with control means; and subclasses 100+ for directive systems with control means.
- 359, Optics: Systems and Elements, subclasses 142+ for light wave remote control of an external device.
- 361, Electricity: Electrical Systems and Devices, subclasses 182+ for radio control of a relay end element.
- 353 Plural conditions from remote station:**  
This subclass is indented under subclass 352. Subject matter wherein two or more operation conditions of a receiver are controlled from a remote control device; e.g., volume and frequency.
- 354 Mechanical:**  
This subclass is indented under subclass 353. Subject matter wherein the remote control device is a mechanical means utilized to vary one or more conditions of a receiver circuit.
- 355 Amplitude, volume, or gain control:**  
This subclass is indented under subclass 352. Subject matter including means for adjusting the signal level (amplitude), amplification (volume), or gain of the receiver system as a function of the transmitted control signal from a remote point.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
232.1+, for nonremote means to control the gain, volume, or gain control of a receiver.
- 400 HAVING SINGLE-CHANNEL TELEPHONE CARRIER:**  
This subclass is indented under the class definition. Subject matter wherein a single telephone speech signal on wired link modulates a carrier signal which has a frequency above the range of human audibility.
- SEE OR SEARCH CLASS:  
370, Multiplex Communications, subclasses 485+ for transmission of more than a single telephone signal on a carrier.
- 401 Including call signaling (e.g., ringing, off-hook, dialing):**  
This subclass is indented under subclass 400. Subject matter which performs a call related signaling operation distinct from voice information.

- (1) Note. These signals are of predetermined frequency and perform the same functions as DC signals in a noncarrier telephone system.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

567, for a radiotelephone call alerting.

SEE OR SEARCH CLASS:

379, Telephonic Communications, subclass 31 for testing of a call signaling arrangement and subclasses 164, 179+, 251+, 350+, and 418 for various telephone call signaling arrangements.

#### 402 **Over power line:**

This subclass is indented under subclass 400. Subject matter wherein a modulated telephone carrier is transmitted over a power line electrical conductor.

- (1) Note. Included herein are residential type plug-in intercoms.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

3.3, for distribution system combined with power distribution network.

SEE OR SEARCH CLASS:

340, Communications: Electrical, subclasses 310.11+ for remote control over power line, and 538+ for condition responsive indicating over power line.

370, Multiplex Communications, subclasses 485+ for combining or distributing information via carrier frequency channels which may be transmitted over a power line.

379, Telephonic Communications, subclasses 167.01 through 167.15 for a general intercom system.

#### 403 **RADIOTELEPHONE SYSTEM:**

This subclass is indented under the class definition. Subject matter wherein voice communication is established between a base and a mobile transceiver via a wireless carrier wave channel that is allocated for use during a communication link and wherein the mobile trans-

ceiver has a specific assigned call address number.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

550.1 through 575.9, for radiotelephone equipment detail.

SEE OR SEARCH CLASS:

379, Telephonic Communication, art collection FOR 101 for telephonic communication having electromagnetic link for speech or paging signal (e.g., light wave link).

#### 404.1 **Emergency or alarm communication:**

This subclass is indented under subclass 403.

Subject matter which includes summoning response to an urgent or hazardous situation over a radiotelephone.

SEE OR SEARCH CLASS:

340, Communications: Electrical, subclasses 287 through 309 for a signal box alarm arrangement.

379, Telephonic Communications, subclasses 37 through 51 for an emergency or alarm communication in a landline telephone network.

#### 404.2 **Location monitoring:**

This subclass is indented under subclass 404.1.

Subject matter including determining the position of a radiotelephone which has made an emergency or alarm call.

#### 405 **Usage measurement:**

This subclass is indented under subclass 403. Subject matter which determines an amount of provided service, such as a time length, number, or frequency of radiotelephone usage.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

2.01, for audience survey or program distribution use accounting.

SEE OR SEARCH CLASS:

379, Telephonic Communications, subclasses 111+ for usage measurement in a landline telephone network.

725, Interactive Video Distribution Systems, subclasses 9 through 21 for surveying or monitoring of receiver use

and subclass 22 for commercial or program airing verification.

**406 Billing:**

This subclass is indented under subclass 405. Subject matter which computes a cost of usage or receives a radiotelephone subscriber payment.

**SEE OR SEARCH CLASS:**

- 379, Telephonic Communications, subclasses 114.01 through 132 for landline telephone call charge metering or monitoring.
- 705, Data Processing: Financial, Business Practice, Management, or Cost/Price Determination, subclass 40 for billing distribution or payment.
- 725, Interactive Video Distribution Systems, subclasses 1 through 8 for billing in a video distribution system.

**407 At subscriber unit:**

This subclass is indented under subclass 406. Subject matter wherein the billing is performed at the radiotelephone terminal.

**408 At remote station:**

This subclass is indented under subclass 406. Subject matter wherein the billing is performed at a place other than the radiotelephone terminal.

**409 Rental:**

This subclass is indented under subclass 405. Subject matter including a service radiotelephone that is available for use in return for a periodic payment.

**410 Security or fraud prevention:**

This subclass is indented under subclass 403. Subject matter having a provision for defeating or indicating an attempt to use the radiotelephone system without a proper authorization or control function.

**SEE OR SEARCH CLASS:**

- 379, Telephonic Communications, subclass 189 for a fraud or improper use mitigation or indication of a landline telephone.

- 726, Information Security, subclasses 1 through 36 for information security in computers or digital processing system.

**411 Privacy, lock-out, or authentication:**

This subclass is indented under subclass 410. Subject matter which permits use of the radiotelephone system only by an authorized subscriber or transceiver.

**SEE OR SEARCH CLASS:**

- 379, Telephonic Communications, subclass 161 for exclusion or priority in a multi-line or key substation system, subclasses 168+ for lockout in an intercom or single line system, subclass 184 for lockout in a polystation or party line system, and subclasses 194+ for lockout or double use signaling of a landline telephone.
- 380, Cryptography, subclasses 247 through 250 for cellular telephone cryptographic authentication.

**412.1 Message storage or retrieval:**

This subclass is indented under subclass 403. Subject matter indented wherein the radiotelephone system is combined with a structure for retention of a message signal or for reproduction thereof.

**SEE OR SEARCH CLASS:**

- 360, Dynamic Magnetic Information Storage or Retrieval, appropriate subclasses for audio information magnetic storage or retrieval, per se.
- 365, Static Information Storage and Retrieval, appropriate subclasses for a static memory element or system, per se.
- 369, Dynamic Information Storage or Retrieval, appropriate subclasses for audio information storage or retrieval, per se.
- 379, Telephonic Communications, subclasses 67.1 through 88.28 for a message storage or retrieval within a landline telephone network.
- 704, Data Processing: Speech Signal Processing, Linguistics, Language Trans-

lation, and Audio Compression/Decompression, subclasses 200 through 278 for speech signal processing.

**412.2 Having message notification:**

This subclass is indented under subclass 412.1. Subject matter wherein the radiotelephone automatically provides an indication or alert to the user that a new or updated message has been received.

SEE OR SEARCH CLASS:

379, Telephonic Telecommunications, subclass 88.12 for message notification within a landline telephone network.

**413 Voice mail:**

This subclass is indented under subclass 412.1. Subject matter wherein the message signal is an intelligible human sound.

**414.1 Special service:**

Subject matter including a switching, connection, or control function additional to those necessary to establish and maintain a single call connection between two stations.

- (1) Note. These services generally involve three or more stations or two or more call connections.
- (2) Note. Examples of such special services are conferencing, call forwarding or transfer, call waiting, etc.

SEE OR SEARCH CLASS:

370, Multiplex Communications, subclasses 259 through 271 for special services combined with multiplex switching.

379, Telephonic Communications, subclasses 157 through 158 for special services on a key telephone system and subclasses 201-218 for special services within a landline telephone network.

**414.2 User location independent information retrieval:**

This subclass is indented under subclass 414.1. Subject matter indented wherein the additional function includes the access of information unrelated to a call between stations.

SEE OR SEARCH THIS CLASS, SUBCLASS:

456.5, for position based personal service such as information retrieval.

**414.3 Based on request (e.g., news, weather, etc.):**

This subclass is indented under subclass 414.2. Subject matter wherein information is obtained at the instigation of a user.

**414.4 Format conversion (e.g., text, audio, etc.):**

This subclass is indented under subclass 414.2. Subject matter indented including modification of the format of received or transmitted data unrelated to a call between stations.

**415 Caller identification:**

This subclass is indented under subclass 414.1. Subject matter which provides either a visible indication or a permanent or semi-permanent record of the calling telephone number terminal.

SEE OR SEARCH CLASS:

379, Telephonic Communications, subclass 120 for a calling number identification on a hardcopy call charge record, subclasses 142.01-142.18 for processing a caller identification signal within a landline telephone network, and subclasses 245-249 for a line identification at a central switching facility.

**416 Call conferencing:**

This subclass is indented under subclass 414.1. Subject matter which enables three or more terminals to be included in a single call connection.

SEE OR SEARCH CLASS:

370, Multiplex Communications, subclasses 260+ for conferencing using a multiplex communication technique.

379, Telephonic Communications, subclasses 202.01 through 206.01 for a call conferencing within a landline telephone network.

**417 Call diversion:**

This subclass is indented under subclass 414.1. Subject matter for directing a call connection from an addressed radiotelephone station to another destination.

**SEE OR SEARCH CLASS:**

379, Telephonic Communications, subclasses 211.01 through 213 for a call diversion within a landline telephone network.

**418 Programming control:**

This subclass is indented under subclass 403. Subject matter comprising an operation controlling logic which modifies operating characteristics of the radiotelephone system.

**SEE OR SEARCH CLASS:**

700, Data Processing: Generic Control Systems or Specific Applications, appropriate subclasses for generic automated control using operation controlling logic processor.

**419 Remote programming control:**

This subclass is indented under subclass 418. Subject matter wherein the programming control is generated at a place other than the location of a device which is being programmed.

**420 Control of another apparatus:**

This subclass is indented under subclass 419. Subject matter wherein the programming control is remotely generated to control a nonradiotelephone system or device.

**421 Out-of-range indication:**

This subclass is indented under subclass 403. Subject matter wherein a visual or audible signal indicates to a mobile user that he or she is approaching or beyond a communication area.

- (1) Note. This subclass may use a signal quality measurement as a parameter for an out-of-range determination.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

456.1 through 457, for location monitoring which does not have an out-of-range signaling feature.

**422.1 Zoned or cellular telephone system:**

This subclass is indented under subclass 403. Subject matter indented including plural stations providing service to different geographical areas.

- (1) Note. Cellular systems are characterized by a large number of base stations enabling channel reuse.

**SEE OR SEARCH CLASS:**

370, Multiplex Communications, subclasses 328 through 338 for multiplex communication in a system having a plurality of contiguous regions served by respective fixed stations.

**423 Diagnostic testing, malfunction indication, or electrical condition measurement:**

This subclass is indented under subclass 422.1. Subject matter for evaluating or monitoring the condition of a zoned or cellular radiotelephone system in order to determine the presence of a faulty or nonstandard condition.

- (1) Note. Testing to determine which one of several normal status conditions of the system exist (e.g., busy-idle, off-hook) is not classified in this or indented subclasses.

- (2) Note. Location determination for a mobile station is not classified herein.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

67.11 through 67.7, for measuring, testing, or monitoring if a system having a transmitter and receiver at separate stations.

115.1 through 115.4, for measuring, testing, or monitoring of a transmitter.

226.1+, for measuring or testing of a receiver.

456.1 through 457, for a mobile unit location determination.

**SEE OR SEARCH CLASS:**

324, Electricity: Measuring and Testing, appropriate subclasses for an electrical measurement or test not limited to a telephone instrument or system.

- 340, Communications: Electrical, subclasses 635+ for fault indication of an electrical apparatus or an electrical parameter.
- 379, Telephonic Communications, subclasses 1.01 through 35 for diagnostic testing, malfunction indication, or electrical condition measurement within a landline telephone network.
- 424 System equipment:**  
This subclass is indented under subclass 423. Subject matter wherein the evaluation, measuring, or monitoring is of a wireless network equipment.
- 425 Subscriber equipment:**  
This subclass is indented under subclass 423. Subject matter wherein the evaluation, measuring, or monitoring is of a mobile user's equipment.
- 426.1 Including other radio communication system (e.g., cordless telephone, paging, trunking, etc.):**  
This subclass is indented under subclass 422.1. Subject matter comprising both a noncellular radio communication and a cellular radio communication.
- 426.2 Wireless service for fixed premises equipment (e.g., wireless local loop (WLL) telco emulator, etc.):**  
This subclass is indented under subclass 422.1. Subject matter which utilizes cellular telephone infrastructure to connect a fixed subscriber equipment to a central office without cabling (e.g., via wireless local loop (WLL) telco emulator, etc.).
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
554.2, for equipment detail providing wireless link to fixed equipment (e.g., WLL, Telco emulator, etc.)
- 427 Space satellite:**  
This subclass is indented under subclass 422.1. Subject matter wherein a man-made vehicle orbiting the earth is used to relay communication signals between stations.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
12.1+, for noncellular satellite communications systems.
- SEE OR SEARCH CLASS:  
342, Communications: Directive Radio Wave Systems and Devices (e.g., Radar, Radio Navigation), subclasses 352+ for directive communication which includes a satellite.
- 343, Communications: Radio Wave Antennas, digest 2 for a satellite mounted antenna.
- 370, Multiplex Communications, subclasses 316+ for a space satellite repeater in a multiplex communication system.
- 428 Switching or routing:**  
This subclass is indented under subclass 427. Subject matter which selects a suitable satellite in a constellation or an antenna beam within a satellite to relay communication signals.
- (1) Note. A satellite usually has more than one antenna beam; each beam covers a particular area on earth via satellite projection.
- 429 Cell projection:**  
This subclass is indented under subclass 427. Subject matter including a layout detail of a particular geographical area on earth being served by the satellite.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
446+, for other particular cell planning techniques.
- 430 Ground station control:**  
This subclass is indented under subclass 427. Subject matter including an earth based station for monitoring and controlling the communication relay operations of the space satellite.
- 431 Airborne or aircraft:**  
This subclass is indented under subclass 422.1. Subject matter wherein a space deployed station or an airplane is used as a communication station or as a relay communicating station.

- (1) Note. The space deployed station in this subclass may be a balloon or blimp.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
427+, for an earth orbiting satellite in a cellular telephone system.
- SEE OR SEARCH CLASS:  
342, Communications: Directive Radio Wave Systems and Devices (e.g., Radar, Radio Navigation), appropriate subclasses for aircraft directive communication in a noncellular communication system.
- 432.1 Roaming:**  
This subclass is indented under subclass 422.1. Subject matter wherein a mobile station operates in a cellular system other than the system where the mobile station is subscribed.
- 432.2 System format conversion:**  
This subclass is indented under subclass 432.1. Subject matter in which conversion or translation of protocols or formatting is required between the visited system and the mobile station or the home system.
- 432.3 Service profile:**  
This subclass is indented under subclass 432.1. Subject matter wherein the home and visited systems allow for transferring or updating of a feature service of a radiotelephone subscriber.
- (1) Note. A feature service includes an individual subscriber's preference, such as preferred provider, abbreviated dialing and call forwarding.
- 433 Home location registration (HLR) or visitor location registration (VLR) detail:**  
This subclass is indented under subclass 432.1. Subject matter having a particular detail of a subscribed or a transitional database which services the roaming operation.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
435.1 through 435.5, for a procedure of registration to a service area.
- 434 Control or access channel scanning:**  
This subclass is indented under subclass 422.1. Subject matter wherein the mobile station searches all available overhead message trains in the system in order to obtain information about each cell prior to a registration.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
32.1, for a system with receiver selection wherein the receiver scans for an address signal.  
515, for a noncellular control or access channel scanning.
- 435.1 Registration:**  
This subclass is indented under subclass 422.1. Subject matter including a procedure by which a mobile station identifies itself to the radiotelephone system as being located within its service area.
- 435.2 System selection:**  
This subclass is indented under subclass 435.1. Subject matter including a choice of systems with which to register.
- 435.3 Based on priority:**  
This subclass is indented under subclass 435.2. Subject matter wherein registration of plural mobile stations is dependent on a pre-established hierarchy of the mobile stations.
- 436 Handoff:**  
This subclass is indented under subclass 422.1. Subject matter wherein a mobile station during a call is switched from a first to a second serving base station, which may be located in different cells (inter-handoff) or located within a cell (intra-handoff).
- SEE OR SEARCH CLASS:  
370, Multiplex Communications, subclasses 331+ for handoff control in a multiplex communication system.
- 437 Mobile assisted or initiated:**  
This subclass is indented under subclass 436. Subject matter wherein the mobile station plays a role in the determination of the new serving base station.

- (1) Note. This is an automatic process which is generated without user participation.
- 438 Serving site initiated:**  
This subclass is indented under subclass 436. Subject matter wherein the currently serving base station sends a request to a mobile telephone switching center to handoff a call.
- 439 Handoff initiated by another source (e.g., target, user initiated, mobile switching center (MSC), or mobile telephone switching office (MTSO), etc.):**  
This subclass is indented under subclass 436. Subject matter wherein a site other than the serving base station or the mobile station originates the handoff.
- (1) Note. The other sources may be a mobile telephone switching office (MTSO), a mobile switching center (MSC), a new serving base station (target), or a user of the mobile unit.
- 440 Based upon unit location:**  
This subclass is indented under subclass 436. Subject matter wherein the handoff is based on a mobile station position.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
456.1 through 456.6, for a location monitoring in a noncellular system.
- SEE OR SEARCH CLASS:  
340, Communications: Electrical, subclasses 988+ for vehicle position indication.  
342, Communications: Directive Radio Wave Systems and Devices (e.g., Radar, Radio Navigation), subclasses 450+ for position indication in a non-radiotelephone cellular system.
- 441 Based upon unit velocity:**  
This subclass is indented under subclass 436. Subject matter wherein the handoff is based on a mobile station speed.
- SEE OR SEARCH CLASS:  
340, Communications: Electrical, subclass 936 for vehicle speed or over speed detection.
- 442 Soft handoff:**  
This subclass is indented under subclass 436. Subject matter wherein the mobile station maintains its assigned channel while entering a new cell (e.g., make before break).
- 443 Overlapping cells:**  
This subclass is indented under subclass 436. Subject matter including the handoff in a special situation where the mobile unit is in a common area between cells.
- 444 Between macro and micro cells:**  
This subclass is indented under subclass 436. Subject matter including a technique dealing with handoff between cells having significantly different coverage areas.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
449, for a hierarchical cell structure layout.
- 445 Call routing (e.g., to prevent backhaul, routing efficiency, least cost, or alternate routing):**  
This subclass is indented under subclass 422.1. Subject matter involving the assignment of a communication path by which information is carried to its destination.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
560, for detail of a switching unit.
- SEE OR SEARCH CLASS:  
370, Multiplex Communications, subclasses 216+ for alternate routing in the case of fault, subclass 238 for least cost or minimum delay routing, and subclasses 351+ for path finding or routing in a multiplex switching system.
- 446 Including cell planning or layout:**  
This subclass is indented under subclass 422.1. Subject matter including a design of cell architecture of the cellular telephone system.

- 447 Frequency reuse scheme:**  
This subclass is indented under subclass 446. Subject matter wherein the cellular system is divided into smaller coverage areas in which a frequency can be simultaneously assigned to different coverage areas with minimum interference.
- 448 Co-located systems:**  
This subclass is indented under subclass 446. Subject matter wherein a second cellular system is added to an existing cellular system at the same location.
- 449 Hierarchical cell structure:**  
This subclass is indented under subclass 446. Subject matter wherein the radiotelephone system contains a site having cells organized into ranks, each subordinate to the one above it (e.g., pico, micro, and macro cells, etc.).
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
444, for handoff between macro and micro cells.
- 450 Channel allocation:**  
This subclass is indented under subclass 422.1. Subject matter wherein a mobile station is assigned a communication resource (e.g., frequency, time slot, etc.) for communication.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
464, for a channel allocation in a private cordless extension system.  
509+, for a centralized channel allocation in a general telecommunication, per se.
- SEE OR SEARCH CLASS:  
370, Multiplex Communications, subclasses 329+ for channel assignment in a region partitioning multiplex communication system, subclass 341 for channel assignment in a radio trunking multiplex communication, and subclasses 431+ for channel assignment in a general multiplex communication, per se.
- 451 Hybrid allocation:**  
This subclass is indented under subclass 450. Subject matter including a combination of dynamic and fixed channel allocation.
- 452.1 Dynamic allocation:**  
This subclass is indented under subclass 450. Subject matter indented wherein a channel is variably assigned.
- 452.2 Based on service quality (e.g., rate, bandwidth, etc.):**  
This subclass is indented under subclass 452.1. Subject matter indented wherein dynamic channel allocation is dependent on a parameter related to desired quality of service.
- 453 Load balancing:**  
This subclass is indented under subclass 450. Subject matter wherein a channel is assigned based on the density of the communication traffic.
- 454 Spectrum sharing for different type of system (e.g., point-to-point microwave, television, etc.):**  
This subclass is indented under subclass 450. Subject matter wherein the cellular system utilizes frequency bands common to other types of systems for allocating channel.
- 455 Channel seizing:**  
This subclass is indented under subclass 422.1. Subject matter wherein a mobile station identifies and commandeers a channel.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
516, for channel seizing in a telecommunication between nonradiotelephone transmitters and receivers.
- 456.1 Location monitoring:**  
This subclass is indented under subclass 422. Subject matter including means to determine the position of a mobile station.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
440, for handoff control based on location.

- SEE OR SEARCH CLASS:  
340, Communications: Electrical, subclasses 988 through 996 for vehicle location indication.
- 342, Communications: Directive Radio Wave Systems and Devices (e.g., Radar, Radio Navigation), subclasses 450-465 for directive position indicating in noncellular and non-radiotelephone systems.
- 456.2 Based on request signal:**  
This subclass is indented under subclass 456.1. Subject matter wherein location monitoring is controlled by a specific signal asking therefor.
- 456.3 Position based personal service:**  
This subclass is indented under subclass 456.1. Subject matter wherein localized information is presented to a user.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
414.2, for user location independent information retrieval.
- 456.4 Quiet or transmission prevention mode:**  
This subclass is indented under subclass 456.1. Subject matter inhibiting transmission or reception by a cellular telephone in a particular location.
- 456.5 At system equipment (i.e., base station)**  
This subclass is indented under subclass 456.1. Subject matter wherein location monitoring is performed at a system base station.
- 456.6 At remote station (i.e., mobile station):**  
This subclass is indented under subclass 456.1. Subject matter wherein location monitoring is performed at a mobile station.
- 457 Location display:**  
This subclass is indented under subclass 456.1. Subject matter wherein the location of the mobile station is visibly indicated.
- 458 Specific paging technique:**  
This subclass is indented under subclass 422.1. Subject matter wherein the radiotelephone system summons a mobile station in a particular manner after an incoming call has been placed to the mobile station.
- 459 Meet-me system:**  
This subclass is indented under subclass 458. Subject matter wherein an incoming call is parked while the radiotelephone system summons the mobile unit and when a response is received the radiotelephone system either connects the call or instructs the responding mobile unit on how to connect to the parked call (e.g., giving a call back number).
- 460 Auto-dialing:**  
This subclass is indented under subclass 458. Subject matter wherein the summons contains a call back number which is stored in the mobile station in order to generate an automatic call back.
- 461 Including personal numbering system (i.e., intelligent network for subscriber tracking or follow-me subscriber feature):**  
This subclass is indented under subclass 403. Subject matter wherein a radiotelephone unit temporarily acquires a user's personal number that allows that user to make or receive calls independently of both a network access point and a specific telephone unit.
- 462 Including private cordless extension system:**  
This subclass is indented under subclass 403. Subject matter wherein a base transceiver having direct connection to a landline telephone switching system provides restricted telephony access to a pre-selected cordless extension unit.
- (1) Note. Equipment for the private cordless extension is not placed in this subclass.
- SEE OR SEARCH THIS CLASS, SUBCLASS:  
550.1 through 575.9, for an equipment detail of the private cordless extension.
- 463 Multi-users:**  
This subclass is indented under subclass 462. Subject matter wherein the restricted telephony access is provided to more than one preselected cordless extension unit.

**464 Channel selection or allocation:**

This subclass is indented under subclass 462. Subject matter wherein a preselected cordless extension unit is assigned a communication resource (e.g., frequency, time slot, etc.) for communications.

SEE OR SEARCH THIS CLASS, SUBCLASS:

450+, for a channel allocation in a cellular telephone system.

509+, for a centralized channel allocation in a general telecommunication, per se.

SEE OR SEARCH CLASS:

370, Multiplex Communications, subclasses 329+ for channel assignment in a region partitioning multiplex communication system, subclass 341 for channel assignment in a radio trunking multiplex communication, and subclasses 431+ for channel assignment in a general multiplex communication, per se.

**465 Including public cordless extension system:**

This subclass is indented under subclass 403. Subject matter including a base transceiver which provides direct connection to a landline switching system for any cordless extension unit (i.e., access is not restricted to a preselected set of cordless extension units).

**466 Auxiliary data signaling (e.g., short message service (SMS)):**

This subclass is indented under subclass 403. Subject matter including transmission of additional data messages which are nondestructive to voice communication.

(1) Note. Auxiliary data signaling is widely used in cellular digital packet data transmission (CDPD) or in short message service (SMS).

(2) Note. Nominal recitations of CDPD or SMS with significant radiotelephone system are classified herein. For significant CDPD or SMS, see SEARCH CLASS note below.

SEE OR SEARCH CLASS:

370, Multiplex Communications, subclasses 328+ and 349 for cellular digital packet data transmission and subclasses 496 and 522 for signaling in a frequency division and time division multiplex communication system, respectively.

**500 Plural transmitters or receivers (i.e., more than two stations):**

This subclass is indented under subclass 39. Subject matter including a plurality of separate and distinct transmitters, or receivers, or transmitter-receiver assemblies, which are physically located at a distance from each other and not restricted by claimed subject matter to other art classes.

SEE OR SEARCH THIS CLASS, SUBCLASS:

7+, for a repeater which may employ plural transmitters or receivers.

403+, for a radiotelephone system wherein the intelligence to be conveyed is voice and which includes significant telephone exchange or landline structure.

SEE OR SEARCH CLASS:

340, Communications: Electrical, subclasses 825+ and 870.11+ for electrical communications in general which may have more than one transmitter or receiver.

**501 Noise, distortion, or singing reduction:**

This subclass is indented under subclass 500. Subject matter wherein any undesired electrical disturbance within the useful frequency band arising from sources internal or external to the system (e.g., crosstalk, power induction, atmospheric noise, etc.); or any undesired self-sustained oscillation existing in the system; or other unwanted signal tending to interfere with the operation of the system is reduced or prevented entirely.

SEE OR SEARCH THIS CLASS, SUBCLASS:

8, for failure compensation in repeaters.

**SEE OR SEARCH CLASS:**

- 375, Pulse or Digital Communications, subclasses 272+ for similar subject matter in a frequency shift keying system, subclasses 279+ for similar subject matter in a phase shift keyed system, subclass 285 for similar subject matter in a pulse modulated carrier wave system in general, subclass 313 for a key click prevention in a pulse modulated carrier wave keying circuit, and subclasses 346+ for similar subject matter in a pulse modulated carrier wave receiver.
- 379, Telephonic Communications, subclasses 338+ for a telephone repeater with echo suppressing or anti-singing circuits.

**502 Synchronized stations:**

This subclass is indented under subclass 501. Subject matter wherein stations in a system are regulated such that each station transmits a carrier wave of the same frequency and phase as those carriers transmitted by the other stations.

**SEE OR SEARCH CLASS:**

- 370, Multiplex Communications, subclass 350 and subclasses 503+ for synchronization in a wireless and in a general multiplex communication system, respectively.
- 375, Pulse or Digital Communications, subclass 272 a synchronized frequency shift keying and subclasses 354+ for synchronizers.

**503 Simulcast system:**

This subclass is indented under subclass 502. Subject matter in which a plurality of remote site transmitters simultaneously broadcast identical audio or data message signals on a particular carrier frequency and a receiving site positioned between two or more transmitting sites receives equal strength carrier signals from each remote transmitter, the message signals from the transmitters being synchronized in time.

**504 Fading compensation:**

This subclass is indented under subclass 501. Subject matter having a device which corrects the undesired variation in amplitude of a received modulated carrier wave.

**SEE OR SEARCH THIS CLASS, SUBCLASS:**

- 10, for fading compensation in a repeating system.

**SEE OR SEARCH CLASS:**

- 375, Pulse or Digital Communications, subclass 345 for automatic gain control in a pulse modulated carrier wave receiver.

**505 Due to weather:**

This subclass is indented under subclass 504. Subject matter wherein the undesired variation in amplitude of a received modulated carrier wave is due to conditions such as: rain, snow, or disturbances in the upper atmosphere, which scatter the signals.

**506 Rayleigh or multipath fading:**

This subclass is indented under subclass 504. Subject matter wherein signal fading is caused by cancellation and reinforcement of signal contributions received over separate paths.

**507 Central station (e.g., master, etc.):**

This subclass is indented under subclass 500. Subject matter having a main station which has at least one transmitter-receiver assembly and a plurality of satellite stations, the satellite stations being connected to the main station by line wire or other means.

- (1) Note. The central station may receive messages transmitted by modulated carrier waves from an external source or from one or more satellite stations within the system and selectively transmit the received messages to all satellite receivers, to a selected satellite receiver, or to a receiver external to the system.
- (2) Note. The satellite receivers may be capable of communicating with each other without the intervention of the central station, but in order to communicate with a station external to the system, the

communication must go through the central station.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

403+, for a radiotelephone system which may include a central station.

561+, for a radiotelephone base station equipment detail.

**508 Having console:**

This subclass is indented under subclass 507. Subject matter having details of an operating control board which monitors the system automatically or via an operator.

**509 Channel allocation:**

This subclass is indented under subclass 507. Subject matter wherein a communication station is assigned a communication resource (e.g., frequency, time slot, etc.) for communications.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

450+, for channel allocation in a cellular system.

464, for channel allocation in a radiotelephone system including a private cordless extension system.

SEE OR SEARCH CLASS:

370, Multiplex Communications, subclasses 329+ for channel assignment in a region partitioning multiplex communication system, subclass 341 for channel assignment in a radio trunking multiplex communication, and subclasses 431+ for channel assignment in a general multiplex communication, per se.

**510 Plural requests (e.g., retries):**

This subclass is indented under subclass 509. Subject matter wherein a station makes repeated attempts for obtaining a communication channel.

**511 Control channel/voice channel conversion:**

This subclass is indented under subclass 509. Subject matter wherein a communication channel can be dynamically assigned as a signaling channel or a voice channel.

**512 Based on priority:**

This subclass is indented under subclass 509. Subject matter wherein an order of importance is assigned to certain communication channels requested from different subscriber stations attempting to gain access to the system at the same time.

**513 Ranking (e.g., based on signal strength, etc.):**

This subclass is indented under subclass 509. Subject matter wherein signal quality parameters (e.g., signal strength, interference level, etc.) of a plurality of communication channels are used in selecting a particular channel for assignment.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

62, for optimum frequency selection.

**514 Having storage detail:**

This subclass is indented under subclass 509. Subject matter having a provision for retaining information regarding a selected channel for aiding in the channel assignment.

**515 Control channel monitoring (i.e., paging or access channel signaling) for system access:**

This subclass is indented under subclass 507. Subject matter which scans information broadcast on a plurality of paging or signaling channels in order to select an appropriate paging or signaling channel.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

161.1+, for frequency scanning by a receiver.  
434, for control or access channel scanning in a zoned or cellular system.

**516 Channel seizing:**

This subclass is indented under subclass 507. Subject matter wherein a station desiring to transmit commandeers a channel.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

455, for channel seizing in a zoned or cellular system.

- 517 To or from mobile station:**  
This subclass is indented under subclass 507. Subject matter in which one or more of the subscriber stations is movable or portable.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
11.1+, for a mobile repeater system.  
90.1 through 90.3, for a portable or mobile transceiver.  
403+, for a mobile radiotelephone system.
- 518 Having talk group:**  
This subclass is indented under subclass 517. Subject matter wherein a common identification is assigned to a particular group of subscriber stations such that any member of the group can transceive information to one another.
- 519 Talk group forming (e.g., dynamic regrouping, talk group assignment):**  
This subclass is indented under subclass 518. Subject matter which assigns a subscriber station to a particular communication group.
- 520 On-site or multi-site trunking:**  
This subclass is indented under subclass 518. Subject matter which includes co-existing trunking systems operating in the same geographical area or a trunking system having more than one base station.
- (1) Note. A trunking system is a system comprising one or more base sites, a resource controller, and a number of subscribers which share a limited number of communication resources. The resource controller grants only upon request via the base site a communication channel to any subscriber desiring the service. The base site in the trunking system supports a much larger coverage area than that of a cellular base station.
- 521 Emergency dispatch or response:**  
This subclass is indented under subclass 517. Subject matter which handles an urgent communication at either the central station or at the subscriber station.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
404.1 through 404.2, for an emergency and alarm communication in a radiotelephone system.
- SEE OR SEARCH CLASS:  
379, Telephonic Communications, subclasses 37+ for emergency or alarm communication using a landline telephone.
- 522 Transmission power control technique:**  
This subclass is indented under subclass 517. Subject matter having detail of a technique for regulating the intensity of signals transmitted between stations.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:  
69, for controlling of a transmitter's parameter by control signal feedback from the receiver.
- 523 Using radiating transmission line:**  
This subclass is indented under subclass 517. Subject matter wherein a signal transmission line extends along the path of a mobile station and that transmission line constitutes the transmitting or receiving antenna of a fixed station.
- 524 Multiple base stations:**  
This subclass is indented under subclass 517. Subject matter wherein more than one fixed station is capable of communication with at least one mobile station.
- 525 Base station selection:**  
This subclass is indented under subclass 524. Subject matter having details of a technique for switching between base stations.
- 526 Plural receivers tuned to common frequency:**  
This subclass is indented under subclass 507. Subject matter in which all or a subgroup of satellite receivers are tuned to a common carrier wave signal frequency.
- (1) Note. For example, tuning to a traffic broadcasting or tornado warning over a radio frequency, etc.

**527 Break-in or priority override:**

This subclass is indented under subclass 500. Subject matter wherein a transmitting operator permits reception of an incoming signal in the interval between his or her own transmitted signals based on an order of importance assigned to the incoming signal.

- (1) Note. If the operator at a central station prevents all the receivers in the system from intercepting a message, except the one for which the message is intended, classification is not in this subclass.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 31.1+, for a system with receiver selection wherein not all the receivers in the system can intercept the incoming message, except the one for which the message is intended.

**528 Lockout or busy-idle signaling:**

This subclass is indented under subclass 500. Subject matter wherein a transmitting operator may prevent other transmitters in the system from operating or may generate a signal indicating the status of the transmitting channel.

**550.1 Radiotelephone equipment detail:**

This subclass is indented under subclass 73. Subject matter wherein the transceiver is dedicated for two-way voice or data communication via a switched telephone network.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 90.1 through 90.3, for a portable or mobile transceiver which contains no telephonic recitations.  
403, for a radiotelephone system.

SEE OR SEARCH CLASS:

- 379, Telephonic Communications, subclasses 419 through 440 for telephone equipment details within a landline telephone network and art collection FOR 101 for telephonic communication having electromagnetic link for speech or paging signal (e.g., light wave link).

**551 Number assignment module (NAM) detail:**

This subclass is indented under subclass 550.1. Subject matter having a memory storage detail denoting an identification number (e.g., a home system registration number, a telephone number, etc.) of a radiotelephone.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 564, for a repertory dialing feature such as a stored number.

**552.1 Operable on more than one system:**

This subclass is indented under subclass 550.1. Subject matter wherein a radiotelephone can be used on at least two systems which utilize different operating standards.

- (1) Note. For example, the operating standards could be the U.S. version of GSM and the European version of GSM, etc.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 432.1 through 433, for a system in which a radiotelephone is a roamer.

**553.1 Radiotelephone having plural transceivers (e.g., for analog and digital, trunking and cellular, etc.):**

This subclass is indented under subclass 552.1. Subject matter wherein operation on more than one system is achieved by multiple independent transceivers.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 127.4, for a dual mode transmitter.

**554.1 Remote private branch exchange (PBX) with wireless link to landline:**

This subclass is indented under subclass 550.1. Subject matter wherein a distant telephone switching unit (private branch exchange) is equipped to communicate via radio frequency connection in place of a wire-line link (e.g., trunk) to a wired telephone system.

**554.2 Equipment detail for providing wireless link to fixed equipment (e.g., WLL, Telco emulator, etc.):**

This subclass is indented under subclass 550. Subject matter including detail of equipment

which makes a wireless link to a local loop or telephone company emulator.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

426.2, for similar subject matter in a cellular telephone system.

**555 Wireless private branch exchange (PBX) (i.e., wireless link to extension unit):**

This subclass is indented under subclass 550.1. Subject matter wherein a telephone switching unit is equipped to communicate via radio frequency link to a wireless extension unit.

**556.1 Integrated with other device:**

This subclass is indented under subclass 550.1. Subject matter wherein the radiotelephone is incorporated within a device which performs a diverse function.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

344 through 346, for receiver combined with diverse art devices.

**556.2 Personal digital assistant (PDA):**

This subclass is indented under subclass 556.1. Subject matter wherein the radiotelephone includes a small handheld digital computing device (PDA) assisting a user in desired communication function and service.

**557 Interface attached device (e.g., interface with modem, facsimile, computer, etc.):**

This subclass is indented under subclass 550.1. Subject matter wherein the radiotelephone has an adaptive circuitry or a connecting device which transfers signals to or from another device or element.

**558 Card control element:**

This subclass is indented under subclass 557. Subject matter wherein the interface is an insertable module which assumes a controlling function in the transferring of signals (e.g., smart card).

- (1) Note. This subclass deals with detail of the card or control element circuitry. For a system with billing capability by inserting a card, see search note below.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

407, for a system in which a module is used for billing at the subscriber unit.

**559 Smart cable:**

This subclass is indented under subclass 557. Subject matter wherein the interface is a wired connection which contains logic circuitry.

**560 Switching unit detail (e.g., mobile telephone switching office (MTSO), base station controller (BSC), etc.):**

This subclass is indented under subclass 550.1. Subject matter including a structural detail of a control station which performs a routing function.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

445, for call routing in a zoned or cellular telephone system.

**561 Base station detail:**

This subclass is indented under subclass 550.1. Subject matter including a structural configuration detail of a mobile communication serving site.

**562.1 Having specific antenna arrangement:**

This subclass is indented under subclass 561. Subject matter wherein the base station includes a particular detail of its aerial arrangement.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

272 through 279.1, for diversity antenna detail.

SEE OR SEARCH CLASS:

343, Communications: Radio Wave Antennas, appropriate subclasses for a particular antenna configuration, per se.

**563 Having voice recognition or synthesization:**

This subclass is indented under subclass 550.1. Subject matter wherein an input speech signal controls the operation of the radiotelephone equipment.

## SEE OR SEARCH CLASS:

704, Data Processing: Speech Signal Processing, Linguistics, Language Translation, and Audio Compression/Decompression, subclasses 200 through 278 for speech signal processing.

**564 Auto-dialing or repertory dialing (e.g., using bar code, etc.):**

This subclass is indented under subclass 550.1. Subject matter wherein a complete call address signal is produced in response to a simple actuation.

- (1) Note. For example, by actuating a single key or by scanning an encoded pattern printed on a card.

## SEE OR SEARCH THIS CLASS, SUBCLASS:

460, for auto paging in a cellular telephone system.

## SEE OR SEARCH CLASS:

379, Telephonic Communications, subclasses 216 through 355.01-357.05 for repertory or abbreviated call signal generation.

**565 Restrictive dialing circuitry:**

This subclass is indented under subclass 550.1. Subject matter having circuitry to disable or confine the output of a call address signal.

## SEE OR SEARCH CLASS:

379, Telephonic Communications, subclass 200 for restrictive dialing circuitry in a landline telephone substation.

**566 Having display:**

This subclass is indented under subclass 550.1. Subject matter having visual presentation of a signal.

**567 Call alerting:**

This subclass is indented under subclass 550.1. Subject matter having indication of an incoming call signal (e.g., ringing).

## SEE OR SEARCH CLASS:

379, Telephonic Communications, subclass 418 for call signal generating in a landline telephone substation.

**569.1 Hands-free or loudspeaking arrangement:**

This subclass is indented under subclass 550.1. Subject matter wherein the radiotelephone equipment contains a special arrangement of its speech-to-electricity transducer component, or any particular arrangement which allows communication without requiring a user to hold or be in physical contact with the radiotelephone.

## SEE OR SEARCH CLASS:

379, Telephonic Communications, subclass 420 for a landline telephone terminal having loudspeaking conversation capability (e.g., hands-free type or speakerphone).

**569.2 In vehicle:**

This subclass is indented under subclass 569.1. Subject matter wherein the hands-free or loudspeaking arrangement of a radiotelephone involves vehicular support or housing.

## SEE OR SEARCH THIS CLASS, SUBCLASS:

575.9, for vehicular radiotelephone housing or support in general.

**570 Noise suppression or echo cancellation:**

This subclass is indented under subclass 569.1. Subject matter wherein any undesired electrical disturbance occurring in signal paths between loudspeaker and microphone circuitry is reduced or prevented.

## SEE OR SEARCH CLASS:

370, Multiplex Communications, subclasses 278 and 282+ for transmit/receive interaction control in a wireless and in a general duplex communication system, respectively, particularly subclasses 286+ for echo cancellation.

379, Telephonic Communications, subclasses 389 through 388.07 for loudspeaker with circuitry for voice control of transmission direction, subclasses 391-392.01 for sidetone

control and noise suppression, and subclasses 406.01-406.16 for echo suppression in a telephone substation or terminal circuitry.

**571 Power booster:**

This subclass is indented under subclass 550.1. Subject matter having circuitry connected to the radiotelephone to raise the transmitted output level.

**572 Power supply:**

This subclass is indented under subclass 550.1. Subject matter including significant details of a source of electrical energy for supplying power to the radiotelephone.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 127.1 through 127.5, for power or bias voltage supply in a radio transmitter.
- 343.1 through 343.6, for power or bias voltage supply in a radio receiver.

SEE OR SEARCH CLASS:

- 307, Electrical Transmission or Interconnection Systems, subclasses 43+ for plural power supply circuits in an electrical transmission or interconnection system.
- 323, Electricity: Power Supply or Regulation Systems, appropriate subclasses for power supply in general.
- 327, Miscellaneous Active Electrical Non-linear Devices, Circuits, and Systems, subclasses 530+ for a specific source of supply having nonlinear circuitry.

**573 Battery charging:**

This subclass is indented under subclass 572. Subject matter having details of the charging or recharging of a DC voltage source.

SEE OR SEARCH CLASS:

- 320, Electricity: Battery or Capacitor Charging or Discharging, appropriate subclasses for battery charging in general.

**574 Power conservation:**

This subclass is indented under subclass 572. Subject matter wherein the radiotelephone equipment contains energy saving means.

SEE OR SEARCH CLASS:

- 327, Miscellaneous Active Electrical Non-linear Devices, Circuits, and Systems, subclass 544 for power conservation using nonlinear circuitry.

**575.1 Housing or support:**

This subclass is indented under subclass 550.1. Subject matter indented having specified enclosure or support means.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 347, for a receiver housing.
- 90.3, for housing or support means of a transceiver other than radiotelephone.

SEE OR SEARCH CLASS:

- 248, Supports, subclasses 309.1 through 316.8 for bracket means for holding a radio that does not claim radio structure.
- 312, Supports: Cabinet Structure, subclass 7.1 for radio cabinets, per se, that do not claim radio structure.

**575.2 Headgear:**

This subclass is indented under subclass 575.1. Subject matter indented wherein a radiotelephone may be attached to a support wearable on a user's head.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 575.6, for a radiotelephone which may be attached to a user in general.

**575.3 Foldable type:**

This subclass is indented under subclass 575.1. Subject matter indented wherein a radiotelephone may be reversibly folded into a more compact configuration.

**575.4 Slidable type:**

This subclass is indented under subclass 575.1. Subject matter indented wherein a radiotelephone has portions mutually linearly movable past each other.

**575.5 Antenna shielding:**

This subclass is indented under subclass 575.1. Subject matter indented including structure

which diminishes undesired radiation from an antenna.

**575.6 Attached or connected to user:**

This subclass is indented under subclass 575.1. Subject matter indented wherein the radiotelephone may be fixed to a user's body.

SEE OR SEARCH THIS CLASS, SUBCLASS:

575.2, for radiotelephone headgear.

**575.7 Having specific antenna arrangement:**

This subclass is indented under subclass 575.1. Subject matter indented including a particular antenna configuration.

**575.8 Protective cover:**

This subclass is indented under subclass 575.1. Subject matter indented including an enclosure for the radiotelephone which diminishes the likelihood of breakage.

**575.9 In vehicle:**

This subclass is indented under subclass 575.1. Subject matter indented wherein a vehicle provides the housing or support for a radiotelephone.

SEE OR SEARCH THIS CLASS, SUBCLASS:

569.2, for a hands-free or loudspeaking arrangement in a radiotelephone vehicular support or housing.

**701 Tone coded squelch:**

This subclass is indented under subclass 68. Subject matter having a device whereby the operating condition of an audio section of a remote receiver is controlled from a distance by means of tone which is sent over an intervening wired or a radio modulated carrier wave circuit.

**702 Plural tones:**

This subclass is indented under subclass 701. Subject matter wherein more than two audio tones are transmitted to control the audio section operating condition.

**703 Difference frequency:**

This subclass is indented under subclass 702. Subject matter wherein the distinction in fre-

quency between two transmitted audio tones is used.

**899 MISCELLANEOUS:**

This subclass is indented under the class definition. Subject matter relating to systems, instruments, or elements specific to modulated carrier wave communication and not provided for in any of the preceding subclasses of this class.

(1) Note. Communication by protons, muons, or neutrinos is included here.

SEE OR SEARCH CLASS:

174, Electricity: Conductors and Insulators, subclasses 32 through 397 for anti-inductive structure with shields or screens; subclass 46 for apparatus wherein an extension power cord forms the handle of a portable radio cabinet; subclass 50 for boxes and housings including radio cabinets which are limited to electrical use; and subclasses 50-64 for such boxes and housings where the box or housing has an electrical device such as radio apparatus cited by name only, or mounting a broadly recited electrical device therein. Wherein the claims specify that the box contains two different apparatus, even though recited by name only, such as a power supply and a tuning stage, the patent will be found in Class 361, Electricity: Electrical Systems and Devices, subclass 814 where no circuit connections between the apparatus is claimed which significantly limit the apparatus to use as a radio apparatus.

178, Telegraphy, appropriate subclasses for telegraph apparatus.

181, Acoustics, subclasses 148+ for diaphragm mounted in a cabinet.

200, Electricity: Circuit Makers and Breakers, subclasses 51+ for electric connectors, including vacuum tube sockets, which have an electric switch structurally combined therewith.

250, Radiant Energy, subclass 250 for radio wavemeters; subclass 305 for electron energy analysis; subclasses 336.1+ for invisible radiant energy responsive electric signalling; subclass 423 for ion generation; subclass

- 489 for ion collectors; and subclasses 200+ for photocell circuits and apparatus.
- 312, Supports: Cabinet Structure, subclass 7.1 for cabinets designed to house radio apparatus. See (1) Note to subclass 7.1 of Class 312 for a statement of the subject matter provided for in Class 312.
- 313, Electric Lamp and Discharge Devices, appropriate subclasses for electric space discharge devices (e.g., radio tubes), per se.
- 323, Electricity: Power Supply or Regulation Systems, subclass 370 for structural combinations of condensers and grid leak-resistances.
- 327, Miscellaneous Active Electrical Non-linear Devices, Circuits, and Systems, appropriate subclasses for miscellaneous circuits which may form components of or be used with the systems of this class.
- 329, Demodulators, appropriate subclasses for demodulators and detectors wherein the useful information which has been modulated onto a carrier wave is derived and utilized.
- 330, Amplifiers, particularly subclass 65 for amplifiers including structural details.
- 331, Oscillators, subclass 187 for miscellaneous oscillator structures.
- 334, Tuners, appropriate subclasses for tuner mechanism, per se.
- 338, Electrical Resistors, subclasses 70+ for mechanically variable electrical resistors mounted in or on a lamp socket which may be a vacuum tube socket; subclass 219 for fixed electrical resistors mounted in or on a lamp or tube socket or base; and subclasses 68+ for rheostats and potentiometers.
- 340, Communications: Electrical, appropriate subclasses, particularly subclasses 850+ for underwater apparatus and subclasses 870.01+ for telemetering systems.
- 343, Communications: Radio Wave Antennas, subclass 702 for antennas combined with a radio cabinet. See also (3) Note, subsection D, under subclass 700.
- 361, Electricity: Electrical Systems and Devices, subclasses 600+ for miscellaneous arrangements of apparatus mounted on a panel, within a box; or other mounting on a panel, within a box or other mounting, including a radio chassis. See the reference to Class 174 above for a statement of the type of apparatus found in Class 361. See subclasses 306.1+ for the structural combination of an electrical condenser, including vacuum tube sockets and an electric condenser. The condenser may be connected to only one or less than all of the socket terminals. Also included in subclasses 306+ are condenser connector combinations where the connector is for the purpose of mounting another electrical device to the condenser, such as condensers with means for mounting and connecting a grid leak in circuit with the condenser. See the reference to Class 323, Electricity: Power Supply or Regulation Systems, for condenser-grid leak resistance combinations.
- 367, Communications, Electrical: Acoustic Wave Systems and Devices, subclasses 95+ and 133 for compressional wave control systems.
- 379, Telephonic Communications, appropriate subclasses for telephone apparatus.
- 439, Electrical Connectors, appropriate subclasses for electrical connectors arranged on a panel with preformed circuit conductors and for devices in which a panel or chassis has connectors such as vacuum tube sockets mounted thereon.

#### FOREIGN ART COLLECTIONS

The definitions below correspond to abolished subclasses from which these collections were formed. See the Foreign Art Collection Schedule of this Class for specific correspondences. [Note: the titles and definitions for indented art collections include all the details of the one(s) that are hierarchically superior.]

**FOR 106 Plural transmitters or receivers (i.e., more than two stations):**

Foreign art collection including a plurality of separate and distinct transmitters, or receivers, or transmitter-receiver assemblies, which are physically located at a distance one from the other and not restricted by claimed subject matter to other art classes.

**FOR 107 Noise, distortion, or singing reduction:**

Foreign art collection wherein any undesired electrical disturbance within the useful frequency band arising from sources internal or external to the system (e.g., crosstalk, power induction, atmospheric noise, etc.); or any undesired self-sustained oscillation existing in the system; or other unwanted signals tending to interfere with the operation of the system is reduced or prevented entirely.

**FOR 108 Synchronized stations:**

Foreign art collection wherein stations in a system are regulated such that each station transmits a carrier wave of the same frequency and phase as those carriers transmitted by the other stations.

**FOR 109 Simulcast system:**

Foreign art collection in which a plurality of remote site transmitters simultaneously broadcast identical audio or data message signals on a particular carrier frequency and a receiving site positioned between two or more transmitting sites receives equal strength carrier signals from each remote transmitter, the message signals from the transmitters being synchronized in time.

**FOR 110 Fading compensation:**

Foreign art collection having a device which corrects the variation or attenuation in amplitude of the received modulated carrier wave.

**FOR 111 Due to weather attenuation:**

Foreign art collection wherein the variation or attenuation in amplitude of the received modulated carrier wave is due to conditions, such as: rain, snow, or disturbances in the upper atmosphere, which scatter the signals.

**FOR 112 Rayleigh or multipath fading:**

Foreign art collection wherein signal fading is caused by cancellation and reinforcement of contributions received over separated paths.

**FOR 113 With central station (e.g., Master, etc.):**

Foreign art collection having a central station which has at least one transmitter-receiver assembly and a plurality of satellite stations, the satellite stations being connected to the central station by line wire or other means.

**FOR 114 To or from mobile station:**

Foreign art collection in which one or more of the satellite receivers is movable or portable.

**FOR 115 With service request and response:**

Foreign art collection in which one station sends a request signal to another station and waits for an answer to start an operation.

**FOR 116 Using radiating transmission line:**

Foreign art collection wherein a signal transmission line extends along the path of a mobile station and that transmission line constitutes the transmitting or receiving antenna of a fixed station.

**FOR 117 Multiple base stations:**

Foreign art collection wherein more than one fixed station is capable of communication with at least one mobile station.

**FOR 118 Plural receivers tuned to common frequency:**

Foreign art collection in which all or a subgroup (i.e., more than two) of satellite receivers are tuned to a common carrier wave frequency, for example, traffic broadcasting or tornado warning over radio frequency, etc.

**FOR 119 Break-in or priority override:**

Foreign art collection wherein a transmitting operator is permitted to receive incoming signals in the intervals between his own transmitted signals base on priority status.

**FOR 120 Lockout or busy-idle signalling:**

Foreign art collection wherein a transmitting operator may prevent other transmitters in the system from operating, and may generate signals indicating the status of the transmitting channel.

**FOR 121 Portable or mobile:**

Foreign art collection wherein the transceiver either (a) is together with the power supply self-contained, of such shape and size as to be readily transportable by an average person and operable during such transport; or (b) has structure specifically designed to permit movement (e.g., wheels) or for mounting in or upon a vehicle.

**FOR 200 HAVING SINGLE CHANNEL TELEPHONE CARRIER:**

Foreign art collection wherein a single telephone speech signal modulates a carrier signal which has a frequency above the range of human audibility.

**FOR 201 Including call signalling (e.g., ringing, off-hook, dialing):**

Foreign art collection which performs a call related signalling operation distinct from voice information.

**FOR 202 Over power line:**

Foreign art collection wherein a modulated telephone carrier is transmitted over a power line electrical conductor.

**FOR 203 Exclusive assigned channel:**

Foreign art collection wherein a station desiring to transmit is authorized a given frequency.

**FOR 204 Seized channel:**

Foreign art collection wherein a station desiring to transmit, selects an unoccupied channel (e.g., idle or non-busy channel, etc.).

**FOR 205 Radio telephone system or equipment detail:**

Foreign art collection including either (a) a base station transceiver connected to a land telephone line, or (b) a mobile station.

**FOR 206 Zoned or cellular:**

Foreign art collection including plural stations providing service to different geographical areas.

**FOR 207 Hand-off control:**

Foreign art collection including means to switch the control of a mobile station to another zone or cell.

**FOR 208 Using plural antennas:**

Foreign art collection in which the handoff control between zones involves the use of more than one antenna.

**FOR 209 With overlapping zones:**

Foreign art collection wherein two or more zones or cells have a partial common area.

**FOR 210 Including cordless extension set (i.e., having single subscriber line access):**

Foreign art collection including a base transceiver connected to a single subscriber line and a cooperating portable transceiver.

**FOR 211 With privacy or lockout (e.g., identity verification):**

Foreign art collection which permits use of a base station only by an authorized subscriber or transceiver.

**FOR 212 Including supervisory or control signaling:**

Foreign art collection for generating, processing, or receiving switching or status indicating signals.

**FOR 213 AUDIENCE SURVEY OR PROGRAM DISTRIBUTION USE ACCOUNTING:**

Foreign art collection for subject matter including means for indicating, metering, or recording the number of receivers using a program, the length of time that a program is being used, or which of several programs is being used.

**FOR 214 DISTRIBUTION SYSTEM (E.G., PLURAL CABLES, ETC.):**

Foreign art collection for subject matter including an organized arrangement of transmission links, of either cable or radiant energy type, for connecting a plurality of discrete subscribers to a source of information signals.

**FOR 215 Receiver for satellite broadcast:**

Foreign art collection for subject matter including a dish antenna for receiving satellite transmissions.

**FOR 216 Combined with power distribution network:**

Foreign art collection for subject matter wherein a carrier wave signal is transmitted over an electric power distribution line.

**FOR 217 Remote control of distribution:**

Foreign art collection for subject matter wherein some functions of a modulated carrier wave source or receiver are supervised or controlled from a remote site.

**FOR 218 With subscriber selection or switching:**

Foreign art collection for subject matter including means for selectively connecting a subscriber line to a distribution system.

**FOR 219 Two-way:**

Foreign art collection for subject matter including means for establishing communication in both directions.

**FOR 220 Common antenna or cable:**

Foreign art collection for subject matter wherein a plurality of receiver sites are connected to a single source of signals, such as an antenna or cable.

**FOR 221 With specific cable converter:**

Foreign art collection for subject matter having specific means to translate a source frequency from an antenna or cable to a different frequency operated by a specific receiver.

**FOR 222 Combined with diverse art device (e.g., audio/sound or entertainment system):**

Foreign art collection for subject matter wherein the distribution system is combined with another art device.

**FOR 223 Near field (e.g., inductive or capacitive coupling):**

Foreign art collection including subject matter which is near field or limited ranged systems (i.e., field strength =  $k/d$  where  $d$  = distance from the transmitter to the receiver) where signal transfer from the transmitter to the receiver is inductive or capacitive rather than electromagnetic.

**FOR 224 Distortion, noise, or other interference prevention, reduction, or compensation:**

Foreign art collection including subject matter with provision for reduction or elimination of distortion, noise, interference, etc.

**FOR 225 With diverse art device:**

Foreign art collection including, in addition to a system under the class definition, other art devices or structures having an added purpose or independent utility other than to perfect an element of the system and in which the utility of the other art device or structure is not destroyed or disturbed by its removal from the system and which combination is not provided for elsewhere.

**FOR 226 With measuring, testing, or monitoring of system or part:**

Foreign art collection including subject matter which relates to means intended solely for the purpose of and adapted to (a) adjust the frequency setting of a carrier wave generation means or determine the output frequency or some other characteristics of a transmitter means; (b) adjust the frequency setting of a local oscillator, a tuning means or other stages of a receiver means in accordance with a standard frequency; (c) compare the frequency of a resonant input or output circuit of a receiver or transmitter with a standard frequency for the purpose of setting a tuning position indicator or dial to correspond to maximum transmitter or receiver output at the standard frequency; and (d) determine the operating characteristics of the whole or selected components of the system under pre-scribed conditions of operation and not elsewhere classified.

**FOR 227 Using a chamber (e.g. room testing or audio surveillance, etc.):**

Foreign art collection including subject matter wherein the measuring, testing, or monitoring is conducted in a confined housing or in a relatively close location.

- (1) Note. For example, method or device for locating an intermodular or interference source in a close proximity to a desired transmitting source, or detecting the presence of a hidden transmitter, e.g., eavesdropping device.

**FOR 228 Noise, distortion or unwanted signal detection (e.g., quality control, etc.):**

Foreign art collection including subject matter having means to detect any undesired electrical disturbance within the useful fre-

quency band arising from sources internal or external to the system (e.g., crosstalk, power induction, atmospheric noise, etc.); or any undesired self-sustained oscillation existing in the system; or other unwanted signals tending to interfere with the operation of the system.

**FOR 229 Using a test signal:**

Foreign art collection including subject matter wherein a signal of predetermined frequency (i.e., reference signal) is sent over the system for testing or measuring purposes.

**FOR 230 Of a microwave link or system:**

Foreign art collection wherein subject matter involves system-using communication signals in the range of microwave frequencies, i.e., approximately 1000 MHz and above).

**FOR 231 Phase measuring (e.g., group delay, propagation effect, etc.):**

Foreign art collection including means to measure the change in phase of traveling waves for developing a suitable control for equalization, attenuation compensation, or synchronization.

**FOR 232 Housing or support:**

Foreign art collection including subject matter having specified enclosure or support means, and not classified above.

**FOR 233 With harmonic radiation suppression:**

Foreign art collection including subject matter having provision for the reduction or suppression of the radiation of harmonics from the antenna.

**FOR 234 Measuring, testing, or monitoring of transmitter:**

Foreign art collection including subject matter having measuring, testing, or monitoring of the signal transmitted.

- (1) Note. The transmitter must be claimed in detail along with the monitoring means, claimed broadly or in detail.

**FOR 235 Power or bias voltage supply:**

Foreign art collection including the details of the source of electrical energy or of the

circuitry connecting such source to the transmitter for supplying power or biasing potential to the active elements of the transmitter.

**FOR 236 With particular power or bias supply (includes battery saving means and include self-powered):**

Foreign art collection with systems including significant details of a source of electrical energy for supplying power to the elements of the receiver or for supplying biasing potential to the electrodes of the active elements comprising the elements of the receiver.

- (1) Note. Class 327, Miscellaneous Active Electrical Nonlinear Devices, Circuits, and Systems, particularly subclasses 530 is the place for miscellaneous circuits having a specific source of supply or bias voltage. See also the SEARCH CLASS section thereunder.

**FOR 237 Emergency or alarm communication:**

Foreign art collection including subject matter which includes summoning response to an urgent or hazardous situation over a radiotelephone.

**FOR 238 Message storage or retrieval:**

Foreign art collection including subject matter wherein the radiotelephone system is combined with a structure for retention of a message signal or for reproduction thereof.

**FOR 239 Special service:**

Foreign art collection with. subject matter including a switching, connection, or control function additional to those necessary to establish and maintain a single call connection between two stations.

- (1) Note. These services generally involve three or more stations or two or more call connections.
- (2) Note. Examples of such special services are conferencing, call forwarding or transfer, call waiting, etc.

**FOR 240 Zoned or cellular telephone system:**

Foreign art collection with subject matter including plural stations providing service to different geographical areas.

- (1) Note. Cellular systems are characterized by a large number of base stations enabling channel reuse.

**FOR 241 Including other radio communication system (e.g., cordless telephone, paging, trunking, etc.):**

Foreign art collection including subject matter comprising both a noncellular radio communication and a cellular radiotelephone system.

**FOR 242 Roaming:**

Foreign art collection including subject matter wherein a mobile station operates in a cellular system other than the system where the mobile station is subscribed.

**FOR 243 Registration:**

Foreign art collection including subject matter wherein a procedure by which a mobile station identifies itself to the radio-telephone system as being located within its service area.

**FOR 244 Dynamic allocation:**

Foreign art collection including subject matter wherein a channel is variably assigned.

**FOR 245 Location monitoring:**

Foreign art collection including subject matter with means to determine the position of a mobile station.

**FOR 246 Radiotelephone equipment detail:**

Foreign art collection including subject matter wherein the transceiver is dedicated for two-way voice or data communication via a switched telephone network.

**FOR 247 Operable on more than one system:**

Foreign art collection including subject matter wherein the radiotelephone can be used on at least two systems which may utilize different operating standards.

**FOR 248 Dual mode telephone (i.e., analog and digital):**

Foreign art collection including subject matter wherein the radiotelephone contains

components which allow communication with both continuous and discrete signal systems.

**FOR 249 Remote private branch exchange (PBX) with wireless link to landline:**

Foreign art collection including subject matter wherein a distant telephone switching unit (private branch exchange) is equipped to communicate via radio frequency connection in place of a wire-line link (e.g., trunk) to a wired telephone system.

**FOR 250 Integrated with other device (e.g., electronic notebook, personal digital assistant, etc.):**

Foreign art collection including subject matter wherein the radiotelephone is incorporated within a device which performs a diverse function.

**FOR 251 Having specific antenna arrangement:**

Foreign art collection including subject matter wherein the base station includes a particular detail of its aerial arrangement.

**FOR 252 Headgear:**

Foreign art collection including subject matter wherein the radiotelephone equipment is wearable upon the head of a user.

**FOR 253 Hands-free or loudspeaking arrangement:**

Foreign art collection including subject matter wherein the radiotelephone equipment contains a special arrangement of its speech-to-electricity transducer component or any particular arrangement which allows communication without requiring a user to hold or be in physical contact with the radiotelephone.

**FOR 254 Portable or mobile:**

Foreign art collection including subject matter wherein the transceiver either (a) is together with the power supply self-contained, of such shape and size as to be readily transportable by an average person and operable during such transport; or (b) has structure specifically designed to permit movement (e.g., wheels) or for mounting in or upon a vehicle.

END