The time spent on-hook between attempts for method (a) or (b) shall be sufficient to cause the telephone company's system to disconnect any incoming call that may have been present when the transmitter went off-hook. See 40.3.2.6.

Exception: The wait of 3 to 7 seconds specified in (a) may be shortened or lengthened if the telephone system in which the transmitter is being used permits or requires it.

40.3.2.8 After the digital alarm communicator transmitter has contacted the digital alarm communicator receiver:

a) It shall verify that contact has been made with the proper receiver and obtain verification that the receiver is ready to receive signals (handshake signal);

b) The transmitter shall send its message;

c) The receiver shall verify that the message is valid; and

d) The transmitter shall switch to on-hook (disconnect) as soon as the verification of its final message and action is received from the digital alarm communicator receiver (kiss-off signal).

The probability of verifying an invalid signal shall be a ratio of 1 to 1000 or less.

40.3.2.9 The digital alarm communicator transmitter and receiver units shall provide for the conditions specified in (a) and (b):

a) If the transmitter does not receive a signal verifying that contact had been made with the receiver, it shall go on-hook after waiting no more than 45 seconds and then attempt to make contact again.

b) If the transmitter does not receive a sign-off (kiss-off) signal indicating that a valid message has been received, verified and accepted, the transmitter shall go on-hook, and then attempt to make contact and deliver the message again. The transmitter may send the message a second time before going on-hook, but shall not wait more than 5 seconds for the sign-off (kiss-off) signal in any case.

40.3.2.10 The DACT shall make no less than five, nor more than ten, attempts to contact the monitoring station receiver, deliver an acceptable message, and receive a sign-off (kiss-off) signal. If the transmitter has made the maximum number of attempts to contact the receiver and has not received an acceptable sign-off (kiss-off) signal, an indication of this failure shall be presented to the alarm system user.

Exception No. 1: There may be an indication to the alarm system user that an attempt has been made to contact the monitoring station receiver during the armed mode whether contact was actually made or not, but a signoff (kissoff) signal as described in 40.3.2.11 is still required as confirmation that the transmission has been successful.

Exception No. 2: If the transmission line has been restored prior to completing the maximum number of contact attempts and all stored signals have been sent, or a communication failure message has been delivered to the monitoring station, the failure to communicate indicator at the protected premises does not need to latch in.

40.3.2.11 When the digital alarm communicator transmitter is placed into the armed mode, the receipt of the sign-off (kiss-off) signal indicating a successful transmission shall be indicated to the user by audible, visual, or both types of signals. If a backup line is used with the transmitter (see 40.3.2.12, the condition of that line, normal or abnormal, shall be indicated to the alarm user when the system is placed into the armed mode.

40.3.2.12 The telephone line connected to the digital alarm communicator transmitter shall be supervised as specified in either (a) or (b):

a) Two telephone lines shall be used and the transmitter shall be able to switch from one to the other. Both telephone lines shall be monitored so that if a fault develops on either one, the transmitter will contact the receiver through the remaining line to report the fault and identify it as a telephone line trouble. In systems having telephone instruments without bell-ringing capacitors, the fault shall be present at least 15 seconds but no more than 45 seconds before the trouble signal is transmitted. In systems having telephone instruments with bell-ringing capacitors, the time to detect a fault may be approximately 65 seconds for each telephone instrument on the line. Therefore, no more than two telephone instruments shall be on each of the two telephone lines. It is suggested that the telephone line used for primary reporting be connected to no more than one instrument.

b) The transmitter shall contact the receiver with an identifiable signal at least once every 24 hours. The normally scheduled opening signal, closing signal, or any other signal may be used for this purpose. If none of these signals are transmitted during a 24-hour period, an identifiable signal, used for this specific purpose, shall be transmitted.

40.3.2.13 If telephone line supervision is provided as described in 40.3.2.12 (a) the transmitter shall switch to the secondary telephone line after one or two attempts to make contact with the receiver on the primary telephone line. After making one or two attempts on the secondary telephone line, the transmitter shall switch back to the primary line. This sequence shall be continued until the transmitter has made the number of attempts required in 40.3.2.10.

40.3.2.14 A digital alarm communicator receiver unit shall accommodate a minimum of two incoming telephone lines. Incoming transmissions shall go to the first available line.

40.3.2.15 A message shall be displayed:

a) On a visual display and a printer;

b) on a minimum of two printers; or

c) by any other equivalent dual means.

A permanent recording of each message shall be made.

40.3.2.16 Each message shall initiate an audible signal that shall continue to sound until manually reset. The audible signal may be silenced separately from the clearing of the visual display. See 40.3.2.17.

40.3.2.17 When a visual display and a printer are used, the printer shall automatically record each message as it is received. The message shall also be automatically shown on the visual display and shall remain visible, or be periodically repeated (scrolled), until manually cleared. The printer or visual display shall continue its operation when the other is out of service.

40.3.2.18 When two or more printers are used, they shall operate as specified in either (a) or (b):

a) A minimum of two printers shall automatically record each message received; or

b) One printer shall automatically record each message received and a standby printer shall be provided that can be put into service within 30 seconds. Failure of an operating printer shall result in audible and visual signals that identify the failed printer. The ratio of standby printers to operating printers shall not be less than 1 to 5.

40.3.2.19 Messages shall be displayed in an alphanumeric code, numeric code, written text, or equivalent code that will identify the transmitter and the nature of the condition that has caused the message to be transmitted.

40.3.2.20 An opening, closing, alternating current power failure, battery failure, or the like, shall be distinguished from alarm signals. An opening (disarming) and closing (arming) signal shall be identified as such.

40.3.2.21 If the digital alarm communicator receiver is automated or connected to a central station automation system, only those messages that require action by an operator need be displayed, for example an unauthorized entry, power failure, battery failure, and the like. Messages relating to opening (disarming) and closing (arming) within the established time intervals shall cause a response by the automated system and shall be recorded in a manner that will allow recall and display by an operator or other authorized monitoring station personnel. Automated systems shall comply with the requirements for automated central station systems in the Standard for Central-Station Automation Systems, UL 1981, and the applicable requirements in this standard.

40.3.2.22 If the digital alarm communicator transmitter determines that opening (disarming) and closing (arming) signals are acceptable or unacceptable, a transmission only once every 24 hours to the monitoring station is required if the method of supervision specified in 40.3.2.12(b) is used.

40.3.2.23 With reference to the requirements of 40.3.2.22, a digital alarm communicator transmitter may determine an acceptable or unacceptable opening (disarming) and closing (arming) as specified in either (a) or (b). The indication of a successful closing signal transmission required by 40.3.2.11 is not required under these conditions.

a) The day to day opening and closing schedule shall be established in the memory of the transmitter so that an opening (disarming) or closing (arming) taking place at an acceptable time will not cause a transmission to the monitoring station. An opening (disarming) or closing (arming) taking place at an unacceptable time will result in a transmission of this condition to the monitoring station. The opening and closing time parameters shall comply with the Standard for Central-Station Alarm Services, UL 827.

b) The alarm user shall be provided with a code that when entered in combination with the action of an opening or closing, shall prevent the DACT from sending a message to the monitoring station. Entry of an incorrect code shall result in a transmission to the DACR.

40.3.2.24 With reference to the requirements of 40.3.2.23(b), there shall not be less than 10,000 codes available for use in the system. A combination of codes may be used by each alarm user and each combination may have different levels of acceptance.

40.3.2.25 The scheduled openings and closings acceptable under the requirements of 40.3.2.23, shall be stored and transmitted to the central-station receiver for recording when the transmitter makes its check-in transmission once every 24 hours. Equivalent methods of storing and recording of the scheduled openings and closings may be used.

40.3.2.26 To prevent the transmission of an alarm signal before an acceptable opening has been initiated, an entry alarm caused by the alarm user entering the protected premises may be delayed up to 45 seconds. However, this delay time shall be added to the attack time specified in 67.2.1.2(b).

40.3.2.27 A digital alarm communicator transmitter shall either be an integral part of the subscriber's control unit or a separate unit that can interface with a subscriber's control unit. As applicable, a separate unit shall comply with the cover and/or rear tamper requirements in this standard.

40.3.2.28 A digital alarm communicator transmitter shall be connected into the telephone switched network (PSTN) and programmed to contact a digital alarm communicator receiver with which it is compatible. The compatible DACR shall be indicated in the product installation instructions.

40.4 One-way radio (RF) systems

40.4.1 Systems employing one-way radio for off-premises communication to the monitoring station shall comply with the applicable requirements in the Standard for Control Units and Accessories for Fire Alarm Systems, UL 864, as well as any operational or attack test requirements of this Standard.

40.5 Two-way radio (RF) systems

40.5.1 Systems employing two-way radio for off-premises communication to the monitoring station shall comply with the multiplex requirements of this standard, 40.6, as well as with the applicable requirements in the Standard for Control Units and Accessories for Fire Alarm Systems, UL 864, as well as any operational requirements of this Standard.

40.6 Multiplex systems

40.6.1 As used in this standard, the term "multiplex system" refers to a system using a method of signaling characterized by the simultaneous or sequential transmission and reception of multiple signals over a single communication channel and provision of means to positively identify each signal. The signaling may be accomplished over a wire path, telephone communication channel, radio carrier, packet switched data networks, or any combination of these. A two-way radio system shall be considered as a multiplex system.

40.6.2 The signal may be transmitted from the protected premises system directly to the monitoring station, or through either a satellite or subsidiary station.

40.6.3 Any change in the status of the protection circuit which is initiated at the protected premises shall be indicated at the monitoring station by audible and visible means. Opening (disarming), closing (arming), alarm, trouble, and their restoration to normal, are considered status change signals.

40.6.4 A change in status shall be automatically recorded. The record shall identify the system, indicate the new status, and include the time and date. A recording device shall consist of either a printer or magnetic medium or other nonvolatile electronic memory capable of being viewed or printed immediately upon request. The year may be manually recorded and need not be shown for each recording. Recorded signals shall be stored in accordance with the applicable time parameters noted in the Standard for Central-Station Alarm Services, UL 827.

40.6.5 Neither an integral nor a supplementary automatic printout is required if each individual protection system supervised by the multiplex system is provided with an individual display. A change in status shall be indicated automatically by the individual display affected.

40.6.6 The system shall continue to monitor the other systems while a status change is being recorded.

40.6.7 A signal that is repeated may be recorded only once, provided that the record indicates the nature of the signal.

40.6.8 Receipt of the signal shall require acknowledgment by the operator. Acknowledgment shall silence the audible signal and result in a visual display of the condition of the system.

Exception: In proprietary burglar alarm applications, acknowledgment is not required for a status change initiated by the operator at the proprietary station, however the initiation of the status change shall result in a visual display (at the proprietary station).

40.6.9 If no constant visual display is provided to indicate the condition of each protection system, a means shall be provided by which the monitoring station operator can determine the condition of any system at any time. A multiplex receiver used in conjunction with an automation system may be employed to determine the status of each system.

40.6.10 There shall not be loss or confusion of signals due to temporary outage of monitoring station equipment or outage of the connecting link between the monitoring station and the protection systems. The protection system, the satellite station, or the subsidiary station shall store information concerning any status change occurring during such an outage. Once the connection to the monitoring station has been re-established, all buffered signals shall be forwarded to the monitoring station.

40.6.11 The time lapse between the occurrence of a single break, single ground, wire-to-wire short, loss of signal, or any combination of these that can prevent the receipt of signals from the portion of the system affected by the fault, and the annunciation and recording of that condition at the monitoring station, shall not exceed 200 seconds from the time the fault is initiated. These faults shall be automatically recorded and the record shall identify each protective system and circuit affected. All changes in the status of the protective systems affected shall also be recorded when the fault is cleared.

Exception: If the protection system uses dual path transmission methods to the monitoring station, the time to annunciate and record a communication failure condition may be 6 minutes (360 seconds). Refer to 40.8.

40.6.12 The protective circuits shall be of the electrically-supervised type and arranged so as to initiate an alarm if the protective circuit is opened, if its conductors of opposite polarity are crossed, or if an initiating device in the circuit transfers to the alarm condition. The wiring between a zone expander and the control unit is considered a portion of the burglar alarm initiating protective circuit.

40.6.13 In a multiplex alarm system, the time lapse between the occurrence of a status change as indicated in 40.6.3 and the annunciation and recording of that change at the monitoring station shall not exceed 90 seconds from the time the fault is initiated. In this time interval, all supervised systems having more than 500 separate signals shall be scanned and the monitoring station shall be capable of annunciating and recording not less than 50 simultaneous status changes in the 90-second time interval. For systems having less than 500 separate signals, the monitoring station shall be capable of annunciating and recording not less than 10 percent of the total status change signals.

40.6.14 A subscriber's control unit shall transmit an alarm signal to the monitoring station if a circuit in the permanent protective wiring (24-hr zone) opens even when the premises is open and the system is disarmed.

40.6.15 A multiplex system shall give priority to signals in the order specified in (a) – (d), and shall annunciate subsequent signals at a rate of not less than one every 10 seconds. The order of priority of signals shall be:

a) Signal associated with life safety (fire alarm, carbon monoxide alarm, medical alarm);

b) Duress, holdup or panic alarm;

c) Burglar alarm;

d) Supervisory signals and trouble signals associated with life safety or security;

e) All other signals.

40.6.16 If a multiplex system does not annunciate signals in compliance with the order of priority specified in 40.6.15, signals shall be annunciated by separate means in such a way that the order of priority is maintained. A multiplex receiver provided with a constant connection to an automation system that has been evaluated in accordance with the requirements of the Standard for Central-Station Automation Systems, UL 1981, satisfies the intent of this requirement.

40.6.17 A multiplex system that incorporates more than five-hundred initiating device circuits, and does not give priority to signals, shall annunciate successive signals at a rate of 1 signal every 1.8 seconds or less (50 signals per 90 seconds). For systems with five-hundred or fewer initiating device circuits, the minimum number of signals annunciated every 90 seconds shall equal 10 percent of the total number of initiating devices in the system.

40.6.18 If multiplex system signals are transmitted directly from the protected systems to the monitoring station and the loss of the communication path prevents the receipt of signals from protective circuits beyond the fault, the number of separate signals on a single path shall be limited to 1000.

40.7 Packet switched data networks (PSDN)

40.7.1 As used in this standard, the term “packet switched data network (PSDN)” refers to transmission accomplished via Internet Protocol (IP), Global System for Mobile (GSM), General Packet Radio Service (GPRS), Code Division Multiple Access (CDMA), High Speed Packet Access (HSPA), Long-Term Evolution (LTE), and other equivalent technologies.

40.7.2 In addition to the applicable requirements for Multiplex Systems in 40.6, packet switched data networks shall comply with the requirements in this section.

40.7.3 Packet switched data network (PSDN) interface equipment, manufactured by other than the burglar alarm equipment manufacturer, that is not provided with the burglar alarm system and/or not required for the processing of the signals shall be evaluated to the applicable requirements of the Standard for Information Technology Equipment – Safety – Part 1: General Requirements, UL 60950-1, or the Standard for Audio/Video, Information and Communication Technology Equipment – Part 1: Safety Requirements, UL 62368-1, as communication equipment. Any network interface device which adds value or manipulates the original data packet such as changing transmission formats, adding encryption, and the like, shall comply with the applicable requirements noted in this standard.

40.7.4 The connection to the network shall be of an "always on" or “on demand” nature and not require the use of the public switched telephone network to make a "dial up" connection. A loss of connection/signal shall be reported and identified within 200 seconds at the monitoring station receiving unit.

Exception: If the protection system utilizes dual path transmission methods in accordance with 40.8, the time to annunciate and record the communication failure condition may be extended to 6 min (360 s).

40.7.5 A single open, single earth ground, or wire-to-wire short on the packet switched data network circuit shall not affect the performance of the premises control unit except for the loss of the communication function extending from that circuit.

40.7.6 Supervision signals between premises alarm equipment and monitoring station alarm receiver equipment shall be managed by the monitoring station receiving equipment and not an intermediate station or intermediary network agent, device or service, unless investigated for such service as a monitoring station.

40.7.7 Neither panel nor receiver operating systems (software or firmware) shall be susceptible to known security breaches.

40.7.8 There shall be message authentication between the premises control unit and control receiving equipment:

a) Each message exchanged between the premises and monitoring station receiving equipment shall include the network address of the premises equipment, and a hashed (scrambled) key which is changed on every message exchange; or

b) A system shall be able to accommodate a minimum of 65,000 distinct account numbers. Message authentication shall consist of an account number plus an additional authentication key which is changed such that a compromise is detected in accordance with 40.14.

40.7.9 Network addressing of devices shall not make use of public domain name servers.

40.7.10 Signals between the premises control unit and the receiving equipment, when not carried by wireless means, shall be protected by one of the following methods:

a) The installation instructions shall state that the communication medium between protected property and communications service provider shall be for the exclusive use of the protected property and is not to be shared with other communications service provider subscribers; or

b) Each message sent between the premises control unit and the supervising station receiving equipment shall be protected with a cryptographic authentication means.

40.7.11 When the premises control unit uses a wireless RF link to a device at the point of demarcation for off premises transmission (wireless LAN or WAN) or directly to the receiver, the signals shall be encrypted.

40.7.12 The display and annunciation requirements for packet switched data network receivers shall comply with the requirements as indicated in this standard.

40.7.13 If there is no constant visual display provided to indicate each protective system, a means shall be provided by which the monitoring station operator can determine the condition of any system at any time. A packet switched data receiver used in conjunction with an automation system may be employed to determine the status of each system.

40.7.14 The alarm receiving equipment shall have a recording device of either a printer, magnetic medium, or other nonvolatile electronic memory capable of being viewed or printed.

40.8 Dual path transmission methods

40.8.1 Signals shall be transmitted by two or more of the following methods:

a) Code Transmitter (McCulloh) (see 40.3.1);

b) DACT (see 40.3.2):

1) PSTN;

2) Cellular;

3) MFVN (see 6.69).

c) One-Way Radio (see 40.4);

d) Two-Way Radio (see 40.5);

e) Multiplex (see 40.6);

f) Packet Switched Data Networks (PSDN) (see 40.7).

40.8.2 Each transmission path shall employ different methods of transmission technology, which pass through separate demarcation points, as they leave the protected property.

Exception: Both transmission paths may be Internet Protocol (IP), provided that each IP path employs a separate IP address and/or Internet Service Provider (ISP). Also see 40.8.8.

40.8.3 The specific transmission function indicated in 40.8.1 shall be provided as part of the product use marking. In addition, a system that meets the requirements of 40.8.5 and transmits alarm signals on both paths shall be marked for its function as a dual path transmission system. See 89.2(c).

40.8.4 A transmission method that does not provide an acknowledgment signal (see 40.13) shall not be used alone. An additional transmission method shall be required to provide an acknowledgment signal.

40.8.5 Loss of communication shall be annunciated at the monitoring station receiver within 200 seconds. If a fault is detected on any of the transmission paths, at least one of the transmission paths shall send a signal to the monitoring station to report the fault within 200 seconds.

Exception No. 1: The time to annunciate and record the communication failure condition may be extended to 6 minutes (360 seconds), if the following conditions are met:

a) A protection system that uses this method of communication supervision shall use two separate paths of transmission to the monitoring station.

b) Each transmission path shall supervise the other. Loss of either path of transmission shall be reported to the monitoring station within 6 minutes (360 seconds) over the operable path.

c) If one path is lost, communication supervision shall be maintained on the remaining path per the single path requirements for the technology used, until dual paths of transmission have been restored. See Table 40.1.

d) An alarm signal is sent to the monitoring station over both paths of transmission. For packet switched data networks, alarm signals do not have to be sent over both transmission paths if:

1) An alarm signal confirmation is sent from the monitoring station receiver to the protected premises over the primary path;

2) The alarm signal confirmation is received and annunciated at the protected premises within 20 seconds of being sent by the monitoring station receiver; and

3) The alarm signal confirmation procedure is documented in the product installation instructions.

e) The following individual faults on the antenna circuit on a One-Way or Two-Way Radio (RF) system that prevents communication to the monitoring station shall be annunciated at the monitoring station receiver within 200 seconds. A fault is defined as:

1) A single open;

2) A single earthground; or

3) A wire-to-wire short.

Exception No. 2: During the disarmed period, the time to annunciate and record the communication failure condition at the monitoring station may be extended to 60 minutes if Exception No. 1 and the following conditions are met:

a) The method used to detect and report the occurrence of a condition that can prevent the receipt of signals from the protection system and to annunciate that condition shall be applied at a statistically random rate. The minimum time between random checks shall be 5 minutes or less.

b) When armed, the system shall check that signals can be transmitted to the monitoring station. If the system cannot send a signal to the monitoring station, a signal to report the condition shall be transmitted to the monitoring station over the second path of transmission.

40.8.6 When an alarm system provides Standard Line Security or Encrypted Line Security on one of the paths, alarm signals shall be transmitted over that path. Opening (disarming) signals shall be transmitted immediately by either:

a) The method of transmission that provides Line Security; or

b) The method that does not provide Line Security. If the opening signal is not transmitted within five attempts, the opening signal, or a failure to communicate that signal, shall be transmitted over the method that provides Line Security.

40.8.7 When an alarm system does not provide Standard Line Security or Encrypted Line Security on either path, the system shall have the capability to transmit an alarm signal over both paths.

40.8.8 A dual line DACT shall be considered as a dual path transmission system if it meets the requirements of 40.8.5 and 40.8.7 and provides for a 24-hour check-in signal over one path. One path shall be a switched landline and the other shall be cellular.

40.8.9 In a dual path transmission system, individual faults on the antenna circuit on an RF system that prevents communication to the monitoring station shall be annunciated at the monitoring station receiver within 200 seconds. A fault is defined as:

a) A single open;

b) A single earthground; or

c) A wire-to-wire short.

40.8.10 A system may also employ an alternate primary path for off-premises communication. A dual path transmission system with an alternate primary path is one in which the alternate primary path provides the same level of integrity as the primary path and is brought into service before the next check-in/polling time interval should the primary path become inoperative. In addition, both the primary and the alternate primary paths shall be provided with the same level of Line Security (e.g. both have Standard Line Security, both have 128-bit Encrypted Line Security, both have 256-bit Encrypted Line Security).

40.8.11 The alternate primary path shall comply with all the applicable requirements in Section 40.

40.8.12 The time lapse between the occurrence of the faults described in 40.6.11 and the annunciation and recording of those conditions at the monitoring station shall not exceed the timings specified in Table 40.1 for the primary, alternate primary, and secondary paths.

40.9 Central/proprietary/police (monitoring) station units

40.9.1 Central/proprietary/police (monitoring) station receivers shall comply with the applicable requirements in this standard, and the Standard for Central-Station Alarm Services, UL 827, or the Outline of Investigation for Hosted Central Station Services, UL 827A. Software-based receiving equipment shall comply with Section 37.

40.9.2 The number of signals in each system used for burglar-alarm signals shall be limited to 1000. If applicable, this requirement shall be noted in the product installation instructions.

40.9.3 If the central/proprietary/police (monitoring) station equipment is completely duplicated with standby equipment, and a switchover can be accomplished in not more than 90 seconds with no loss of signals during this period, the capacity of the system is to be considered unlimited.

40.9.4 The central/proprietary/police (monitoring) station equipment shall be designed and constructed so that any critical component can be replaced and the system restored to service within 30 minutes. This requirement shall be noted in the product installation instructions.

40.9.5 With reference to the requirement in 40.9.4, a critical component is one in which a malfunction will prevent the receipt and interpretation of signals by the monitoring station operator.

40.10 Automation system units

40.10.1 As used in these requirements, an automation system unit refers to monitoring station equipment that can automatically process routine signals, such as scheduled openings and closings, and record them. A signal requiring an operator's attention, such as an alarm signal, shall be recorded and both visually and audibly annunciated in a manner that identifies the source and type of signal for action.

40.10.2 Automation systems shall comply with the requirements in the Standard for Central-Station Automation Systems, UL 1981.

40.10.3 An automation system unit shall be completely duplicated and provision shall be made for switchover in a period of not more than 90 seconds, without loss of signal during this time. This requirement shall be noted on the product installation instructions.

Exception: If an automated system unit serves not more than one thousand active systems and not more than five thousand inactive systems, and uses manual backup equipment, duplication is not required. An active system is a system that transmits a signal to the monitoring station indicating that the system has been:

a) Opened and the alarm protection removed; and

b) Closed and the alarm protection set.

40.10.4 An inactive system is a system that transmits a signal to the monitoring station only when an unintended condition exists or it is under test. A holdup alarm system is considered inactive since it supervises protected circuits without the use of opening and closing signals.

40.11 Satellite/subsidiary stations

40.11.1 A satellite/subsidiary station shall be connected to a manned central-/proprietary/police (monitoring) station by two or more supervised channels, of which any can be used to operate the system.

40.11.2 If all of the channels between a satellite/subsidiary station and a manned monitoring station are inoperative, any signals received by the satellite/subsidiary station shall be automatically recorded or stored until the satellite/subsidiary station can be manned or the channels restored.

40.11.3 Signals received at the satellite/subsidiary station during the time that the channels are inoperative shall be transmitted to the monitoring station when operation is restored.

Exception: Transmission is not required if personnel manning the satellite/subsidiary station have cleared the signals.

40.11.4 A satellite/subsidiary station shall be equipped so that it can be manned and operated as a monitoring station, and as such shall also comply with the requirements of 40.9.

40.12 Private radio facilities

40.12.1 If a private radio carrier is used, the requirements in 40.12.1 – 40.12.10 shall apply.

40.12.2 Central, proprietary, police, satellite, or subsidiary stations shall be provided with dual transmitting and receiving equipment.

Exception: Remotely located equipment need not be duplicated unless six or more protection systems are dependent on it.

40.12.3 Each set of equipment in a dual-equipment installation shall be arranged so that either set can be used for operation of the system.

40.12.4 Switchover from the operating transmitter to the standby transmitter shall be accomplished in 30 seconds or less. The transfer shall be automatic, or capable of being affected manually by operating personnel.

40.12.5 Operating personnel shall be able to deactivate either transmitter independently of the other.

40.12.6 The dual receivers shall be energized at all times and provision shall be made for selection of a usable output from one of the two.

40.12.7 If the equipment is located in an unmanned area, the circuit extending between the monitoring station and the equipment shall be supervised to indicate to operating personnel that a fault has occurred.

40.12.8 Each transmitter and each receiver shall have its own antenna.

40.12.9 A visible display at the monitoring station shall, at all times, indicate the condition of each set. An audio-visual signal shall annunciate any malfunction that would prevent either set from operating.

40.12.10 The conditions specified in (a) – (d) shall be supervised at the monitoring station:

a) Transmitter in use (radiating).

b) Impaired operation of AC power supplying either the transmitting or receiving equipment.

c) Receiver malfunction.

d) Automatic switchover.