

CIVIL AIR DEFENSE WARNING
ATTACK WARNING SERVICE
"BELL-AND-LIGHTS"
PLANT SERVICE PROCEDURES

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1. GENERAL

1.01 This section outlines plant operating procedures to be followed with the attack warning service (AWS) networks, sometimes referred to as "Bell-and-Lights" employed for dissemination of alerts under the Civil Air Defense Warning (CADW) plan of alerting the civilian population. In particular, AWS networks as provided for the State of California Office of Civil Defense in the various Mutual Aid Regions are dealt with herein.

1.02 Detailed description of this system and its operation are contained in Bell System Practices Section 951.081.01. Standard circuit orders, service orders and maintenance practices apply in all cases not covered specifically by this section.

(a) Summary of Bell System Practices Reference Sections:

(1) The following Bell System Practices cover in detail the assignment, installation, maintenance and operation of the AWS networks:

A204.523	
A204.526	951.081.01
A204.527	F23.922
A204.529	M25.97 - M36.55
A204.530	C56.102

(2) In addition to these, the following standard practices cover the protection of special lines and the reporting of abnormal conditions:

A302.099
A502.001
A509.091
F26.906 - E12.514
G32.120.1
G61.115
M24.32
M25.88

1.03 AWS networks are established on a 24-hour daily basis. All possible precautions shall be taken to prevent service interruptions. Any work on facilities devoted

to service on these networks shall be closely supervised to assure adequate protection against service interruptions. Service shall be restored with the minimum delay when interruptions do occur.

1.04 Definition of terms used in this section:

(a) Regional Areas by counties. The following identifies the counties in the Northern California Area, by region, to indicate their relation with regard to the dissemination of alerts. Normally each region will be served by an AWS network, and is alerted from a control or alternate control dial station previously designated for this purpose.

Region 1

Del Norte, Humboldt, Lake and Mendocino

Region 2

Butte, Glen, Lassen, Modoc, Plumas, Shasta, Siskiyou, Tehama and Trinity

Region 3

Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma

Region 4

Alpine, Amador, Calaveras, Colusa, El Dorado, Nevada, Placer, Sacramento, San Joaquin, Sierra, Stanislaus, Sutter, Tuolumne, Yolo, Yuba

Region 5

Monterey, San Benito, Santa Cruz

Region 6

Fresno, Madera, Mariposa, Merced

Region 6-A

Kern, Kings, Tulare

Region 7

San Luis Obispo (also Santa Barbara and Ventura Counties in Southern California Area)

(b) Control Dial Station: The point at which alert signals are dialed to all stations on a regional network by the customer (local channel required).

(c) Alternate Control Dial Station: An alternate point at which the customer can perform the same functions performed at the Control Dial Station when desired (local channel required).

(d) Local Channel: The outside plant facility required between each control and/or alternate control dial station and the central office dial pulsing receiving equipment.

(e) Receiving Station: A signal receiving point equipped with a Station Signal Indicator, (see BSP 951.081.01, Fig. 5) provided as follows:

1. Station bell and colored lights arranged to receive all signals.
2. Station bell and colored lights arranged to receive red and white signals only (no yellow or blue).

(f) Dial Pulse Receiving and Code Distributing Unit: The central office equipment provided at those offices in the network that receive dial pulses and disseminate alerts to individual warning stations via local loops. This equipment is sometimes referred to as the Central Office Serving Unit.

(g) Two-Way Signaling Repeaters - One-Way Two-Way Operation: A two-way signaling repeater is equipment in the central office provided to receive and repeat DC pulses. In general the two-way repeaters are required in the "backbone" portions of each network; that is, between the Control and Alternate Control points. By providing a one-way two-way key, these repeaters may be arranged for one-way two-way operation. The purpose of arranging the two-way repeaters for key controlled one-way two-way operation is to limit the effect of false signaling into the network which is an aid in the location of trouble on the network. By use of this key, the network can be made directional. The two-way equipment alarm feature is retained whenever the one-way key is operated.

Originally the balanced loop signaling repeaters (SD-95681-01) and two-way open-closed loop signaling repeaters (SD-95682-01), used on main sections of the AWS network, were not arranged with an option to provide key controlled one-way two-way operation. A modification, per Drawing KS-3705, has been applied to repeater circuits (SD-95681-01 and SD-95682-01) in the Northern California Area and is not to be confused with standard options made available on later issues of these circuits by the American Company.

1. Operation: With the one-way two-way keys normal, the modification is cancelled and the circuits operate as described in their circuit description sheets.

When the one-way two-way keys are operated as shown in Table No. 1, the directional feature for transmitting alerts is placed in operation. Due to the circuit differences between the balanced loop and the open-closed loop repeaters, the key operation is different. Each link of the network between equipment units is terminated at a repeater at each end. The possible combinations of balanced loop and open-closed loop repeaters in one link of the network are as follows:

TABLE NO. 1

Desired Direction of One-Way Signaling

Circuit Assigned at Originating Office	Key Position	Circuit Assigned at Terminating Office	Key Position
SD-95681-01	Normal	SD-95681-01	Operated
SD-95682-01	Operated	SD-95682-01	Normal
SD-95681-01	Normal	SD-95682-01	Normal
See Note 1			
SD-95682-01	Operated	SD-95681-01	Normal

NOTE 1: If repeaters are assigned in this order the one-way feature will not operate.

2. 10A Key guards are furnished with each key to block it in the specified position to prevent false operation.

3. Regular Operation of Network: The position of the one-way two-way keys for regular operation will be specified on trunk transfers or circuit orders.

4. Emergency Operation of Network: During work on the main portion of the network due to changes in layout or emergencies, it may be necessary to reverse the direction of signaling on a part of the network or to make one or more links in the network two-way signaling. The change of position of the one-way two-way keys will be directed by the control office. It may be necessary to dispatch a man to unattended points to change key positions.

(h) Signaling Network: The private line telegraph network, either intercity, intracity or both, which interconnects two or more dial pulse receiving and code distributing units in the region involved. (Note: Alternate routing arrangements are provided whenever feasible in the major portion of each signaling network to facilitate restoration).

(i) Regional Network: The complete AWS network serving a particular regional area, per 1.04 (a).

(j) Control Office: The control office, designated by toll circuit layout order, responsible for the operation and overall service maintenance of an AWS network. The control office is an office, covered 24-hours daily, having liaison with the customers' Control Dial Station. A direct telephone order wire may be employed to provide for instantaneous communication between them.

(k) Subcontrol Office: One or more additional offices within the signaling network designated, when necessary by circuit order, to serve as subcontrol. Usually such an office will serve an integral part of the regional network. Subcontrol offices are responsible at all times to the network control office for service on that portion of the network under their subcontrol.

(1) Control and Subcontrol Offices:

1. Region 1

Control - Ukiah Toll
Subcontrol - Eureka and Lakeport Toll

2. Region 2

Control - Redding Toll
Subcontrol - Chico Toll

3. Region 3

Control - Oakland Toll
Subcontrol - San Jose, Crockett, Santa Rosa, San Rafael Toll and San Francisco Market Central Office

4. Region 4

Control - Sacramento Toll
Subcontrol - Stockton and Modesto Toll

5. Region 5

Control - Watsonville Toll
Subcontrol - Salinas Toll

6. Region 6

Control - Fresno Toll
Subcontrol - Merced Toll and Madera Central Office

7. Region 6-A

Control - Bakersfield Toll
Subcontrol - Visalia Toll

8. Region 7 - Southern California Area

Control - Santa Barbara Toll

1.05 Control point dialing loops and inter-office facilities associated with the signaling network are arranged for continuous self-test. Accidental grounds and crosses will activate alarms in the Central Office Serving Units. Random grounds or crosses may result in false network alert indications. Because of this, special safeguarding measures (SSM), are applied throughout these facilities. These measures are arranged for in the OPLS order for interexchange trunks and in the local service orders covering Control and Alternate Control Dial Station loops.

2. RESPONSIBILITIES OF ALL OFFICES

2.01 Operating responsibilities of all offices included in these networks shall be as outlined in current Bell System Practices supplemented by this section.

2.02 No work or testing of any kind, other than work that is necessary to restore service during interruptions, shall be performed on any equipment or facility, which may affect the service without the approval of the control office. Work that must be done shall be closely supervised to assure adequate protection. (See paragraph 1.03).

2.03 Personnel in central offices (excluding unattended offices) containing AWS equipment shall respond immediately to alarm and/or trouble indications received by the equipment. The control office, otherwise the subcontrol office, shall be notified without delay of all alarm indications and irregularities observed. Such reports received at the subcontrol office will be reported immediately to the control office. Restoration of network service, with respect to action to be taken by individual offices, will be directed by the control office.

2.04 When the service to receiving stations is affected, reports to the control or subcontrol office shall be forwarded without delay. The report shall include the stations affected by number and the cause of the trouble when known, together with such other details as required by the control office. (See paragraph 3.03, Reports of all false alerts and service interruptions compiled by the control office).

2.05 Complete and accurate records of all action taken in connection with alarm indications, service interruptions, or tests on the network shall be kept by each attended office involved.

3. RESPONSIBILITIES OF CONTROL OFFICE

3.01 Each control office is responsible 24-hours daily for overall services on the network that it controls. This involves close liaison with the customer dial station in connection with each series of alerts dialed into the network, each overall network test and all instances of curtailment or

interruption of network service continuity. Tests that are initiated by the control office shall be verified to all locations by this office and an analysis made to insure that the trouble has been cleared and that all equipment has been restored to normal.

3.02 The control office shall verify for authenticity all alert indications received on monitoring station signal indicators with the control dial station. If it is determined that a false alert has been dialed, the control office shall arrange to have the STOP signal transmitted immediately into the network, by the control dial station, followed by a transmitted WHITE signal for a period of at least one minute.

3.03 Reports of all false alerts, service interruptions and releases on the network, including stations, shall be compiled by the control office and forwarded to the office of the Division Plant Manager (Toll) in accordance with current reporting practices. The report shall include the following information:

1. Identification of Attack Warning Service Network involved.
2. Names of central offices and number of stations affected.
3. Type of False Alerts Received.
4. Time and duration of Service Interruption (including releases) or False Alert.
5. Central office Alarm Indications received.
6. Method used to clear Service Interruption or False Alert.
7. Cause of Service Interruption or False Alert.
8. Publicity (newspaper, radio, etc.) received, if any.
9. Suggestions concerning circuit layout, basic design, operating procedures, etc., which may arise through the analysis of the cause of the failure.
10. Time that Control Dial Station and Sacramento Toll Testboard were notified.

3.04 On service interruptions and false alerts to those stations that are billable to the State of California and commonly known as "State Stations"; the control office shall notify the Sacramento Toll Testboard who in turn shall notify the personnel on duty for the State of California (Hillcrest 7-9804) where coverage is provided on a 24-hour basis by the State of California. These reports shall be limited to include only the following conditions:

- (a) Any service impairment to a state station during a daily test or actual alert.
- (b) Any time it is known that a state station will be out of service (excluding cases where station will be restored within a short period, such as: blown fuse, patch to spare facilities, cut off in error etc.).
- (c) False alerts - cases where state receiving stations are activated without being dialed from a dial control point.

3.05 The control office will be responsible for maintaining accurate records of the network under its control. These records shall include the circuit arrangement and a current list of all stations. State Stations shall have special identification in order that they may be readily identified for reporting in accordance with 3.04 above.

3.06 Network records shall be kept current from copies of OPLS orders or from spare copies of service orders which are received from the local test desk on completion of connect, disconnect or change orders.

3.07 Approved abbreviations and codes used on service orders covering AWS Bell-and-Lights System station installation are covered in Appendix 1A of this section.

4. RELEASE OF NETWORK FOR TESTS

4.01 The control office shall be responsible for obtaining all releases from the customers' control point.

4.02 The network, or any portion thereof, shall not be removed from service for any purpose, without first obtaining a release from the control office.

4.02 Releases for tests shall be closely supervised. The section under test shall be kept in such condition that restoration can be made immediately upon request by the control office. Out-of-service time of the network, for testing purposes, shall be kept to a minimum.

4.04 Service patching and any other action which may be required shall be dispatched and followed through by the control office.

5. TESTS AND OBSERVATION OF OPERATION

5.01 Overall system operation tests will be conducted by the customer on a regularly scheduled basis. During these tests, code distributing units and signal indicators shall be observed at attended offices. The observations resulting from the tests shall be reported to the control or subcontrol office as covered in 2.03.

6. ALARMS

6.01 Four types of central office alarms are provided with the AWS systems:

1. The usual fuse alarms associated with the power and ringing supply circuits.
2. The control point dial alarm lamp (ALM) which indicates that a pulse has been transmitted from a dial at the control point to the one-way receiving repeater. The alarm is retired by operating the CA key located at the one-way receiving repeater equipment unit.
3. The dial pulse receiving and code distributing unit alarm (ALM) which indicates that any pulse (alert digit, prime digit, wrong digit, test or trouble condition) is transmitted over the network. This alarm is released by operating the CA key located at the dial pulse receiving and code distributing equipment unit.
4. Line trouble alarms that indicate trouble conditions which would prevent the transmission of alerts over any part of the AWS network. Such a trouble grounds the F lead on each one-way two-way repeater involved which activates the central office audible and visual alarms. This alarm is released by operating the ACO key located at the one-way two-way repeater equipments. Key ACO when operated causes guard alarm lamp (G) to light and remain lighted until this key is restored to normal.
5. In addition to the dial alarm (ALM), lamps PD and WD are provided to aid in determining the dialing status of the dial pulse receiving and code distributing units.
6. Alarms are described in detail in Bell System Practices Section 951.081.01.

7. EMERGENCY OPERATION

7.01 It is the responsibility of the control office to prepare advance plans to effect rapid restoration of the network under emergency conditions. Subcontrol offices are designated to facilitate this planning and to assist the control office in the administration of such plans.

7.02 The signaling networks, both intercity and intracity, are equipped with repeaters, (see 1.04 (g)) that have automatic alarm features which indicate the faulty section in the network and produce audible and visual signals at the offices adjacent to or on each side of the trouble section. It is imperative that each attended office receiving the alarm indication, immediately notify the control office who will notify the customer control point and take such further action as is determined necessary.

7.03 Dial pulse receiving and code distributing units in central offices are not in every case a part of the backbone signaling network. Failure of the interexchange line facilities to such an office will not affect the backbone network; however, any such failure will affect the station control unit in this office.

7.04 Where it is not possible for the designated control dial station to function, the network may be served by an alternate control dial station as designated by the customer and equipped as a control point with access to the network at a serving office.

7.05 If the control office is unable to function, the designated subcontrol office shall assume network control responsibilities and shall notify each remaining subcontrol office of the change in network control.