PRIVATE LINE TELEPHONE SERVICE
SAC PRIMARY ALERTING SYSTEM
DESCRIPTION

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1. GENERAL

1.01 This section describes the general operation and operating features of the Primary Alerting System (PAS) for the Strategic Air Command. It has been revised to include information on the following:

(a) Circuits which extend to Missile Site Command Posts.

(b) Conference calls from a Base Command Post to SAC and Headquarters.

(c) Special Alerting arrangements.

Due to the extensive number of additions, the usual indicating marks have been omitted.

1.02 The Primary Alerting System is a voice alerting network designed specifically for alerting the Strategic Air Command's striking force quartered at Bases throughout the world. The system is a network of 4-wire voice circuits connecting the Offutt Strategic Air Command (SAC) main control point with each of the three numbered Air Force Headquarters (March, Amherst, Barksdale) and its associated Air Force Bases (AFB) and Missile Complexes. (See Figs. 1 and 2.)

1.03 Each Air Force Base in the PAS is connected directly to the Strategic Air Command control point (referred to here as SAC) by a 4-wire circuit. Each Base and Missile Complex Command Post is also connected by another 4-wire circuit to the Air Force Headquarters with which it is associated and each of the Headquarters is similarly connected to the SAC location. Other manned points on a missile complex are connected to the circuit to the Headquarters on a receive-only basis, and can be arranged to monitor both directions of transmission or to monitor only transmissions from the Headquarters. The circuits from SAC to Bases with missile complexes are equipped with a distribution bridge at the base. The outputs of this bridge provide a receive-only capability to manned points in the missile complex.

1.04 An alert can be initiated by SAC direct to all Headquarters, Bases and Missile Complexes or from any Headquarters to its associated Bases and Missile Complexes. In the case of a SAC alert, each Base and Missile Complex will also receive the alert through its own Headquarters. Special arrangements have been provided which will allow SAC Airborne Command Posts to initiate alerts. This is covered in sections on the SAC Airborne Command Post.

1.05 All PAS circuits are available for point-to-point message use during nonalert periods. Each receiving line at a base or missile complex command post is equipped with a loudspeaker, modified for a minimum volume setting, a recorder and a telephone handset. At each Headquarters, the receive lines from SAC are similarly equipped.

1.06 Each 4-wire line in the PAS is equipped for continuous continuity checking. Any interruption or condition of excess noise lasting for about twenty seconds, on either a transmitting or receiving line, will result in a visual and audible alarm at SAC or a Headquarters location. When the customer operates an alarm cutoff key, the alarm will be transferred to the telephone company equipment room.

1.07 The pulses required for the continuous continuity check, as well as pulses for signaling and control functions, are transmitted over each line by 43A1 telegraph carrier equipment. This channel equipment operates in a frequency slot near the upper end of the voice-band. A midband frequency of 2635 cycles is used on circuits from SAC to each Headquarters and Base, and from each Headquarters to a Base or Missile Complex Command Post. A mid-band frequency of 2465 cycles is used in the opposite direction. A midband frequency of 2805 cycles is also used for Missile Complex Command Posts to Headquarters. The continuity pulses are recognized at the base or missile complex command post end of each circuit and a different frequency pulse returned over the opposite direction channel of the same circuit to the Headquarters or SAC.

1.08 Three forms of pulses are used for various functions designated as "slow", 'fast", and "long". (See Fig. 3.) "Slow" pulses used for all continuity checking are pulses of 260 milliseconds duration transmitted at a rate of one every 3 seconds. "Fast" pulses used to perform functions at the start of an alert, and the acknowledgment of an alert," are 100 millisecond pulses at a 5-cycle per second rate. "Long" pulses of 1.5 seconds duration are used during nonalert periods for signaling from the Bases to SAC, Bases to Headquarters, Missile Complexes to Headquarters and from Headquarters to SAC. Point-to-point signaling during nonalert periods in the opposite direction is by voice over the loudspeaker.

2. ESTABLISHING PAS ALERT

2.01 An alert may be established either from SAC to all Headquarters, Bases and Missile Complexes or from any Headquarters to its associated Bases and Missile Complexes. At SAC and at each Headquarters two red "alert handsets" are connected to the input of an "alert bridge" by a hybrid. The transmitting side of each outgoing circuit is permanently connected to the output of this bridge. Sidetone for the red alert instruments is provided from one of the bridge outputs. Fig. 4 is a simplified layout of the Primary Alerting System, showing SAC, a Headquarters location, and a Base.

2.02 The transmitting sides of the gray telephone sets used for nonalert point-to-point use of the circuits are connected to each circuit at the bridge output legs. A 60 db loss between bridge output legs prevents interference between circuits in the nonalert condition. The gray telephone sets are automatically disconnected from the bridge output circuits in the alert condition.

2.03 To initiate an alert condition, the operator at the Chief Controller's console at either SAC or a Headquarters selects a red instrument and operates the nonlocking "ALERT" key. This performs the following functions:

(a) A distinctive (900-1400-cycle) "alert warning" tone is connected to the input of the bridge as long as the key is held operated. This warning will, of course, be heard by all parties using any of the circuits at the time for normal point-to-point use and at all receiving loudspeaker locations.

(b) A three-second "fast pulse" control signal is transmitted to all locations.

(c) An acknowledge (ACK) lamp for each connected point will be lighted at the initiating location and at each multipled console at each Headquarters receiving the alert.

(d) All equipment required for point-to-point use of the circuits at SAC or Headquarters is disconnected from the bridge or otherwise deactivated.

(e) An ALERT busy lamp will light at each SAC and Headquarters operator position.

2.04 The above situation is established with the operation and release of the "ALERT" key. On release of this key the verbal alert message is transmitted and an acknowledgment requested. Each point receiving the message will acknowledge by operating a nonlocking acknowledgment key (ACK key). Operation of this key will send out a three-second fast pulse signal

from each Base to SAC and its associated Headquarters, each Missile Complex command post to its associated Headquarters and from each Headquarters to SAC. Receipt of this signal will extinguish the acknowledgment lamp associated with each point.

2.05 An alert condition is cancelled by operation at the alert originating point of the alert release key (ALERT RLS). Operation of this key will restore the network to the nonalert condition and make all circuits available for point-to-point message service.

2.06 At each Headquarters Chief Controller's position a nonlocking SAC cutoff key is provided (SAC CO) to permit disconnecting the SAC circuit from the input to the Headquarters alert bridge. This permits the Headquarters Controller to initiate or relay an alert in case the SAC circuit is noisy or otherwise in trouble at the time. Operation of this key does not remove the loudspeaker from the SAC circuit, so that supervision of the incoming circuit is maintained.

2.07 A switching arrangement has been provided at each Headquarters to transfer the input of the alert bridge to an alternate circuit from SAC in case the regular circuit fails. The transfer may be done manually by the operator at the Headquarters, by nonreceipt of alert pulses or by nonreceipt of one slow pulse during an alert transmission after the alert pulses have been received. If the alternate circuit should fail after an automatic transfer and the regular circuit has restored, an automatic transfer back to the regular circuit will occur.

3. NONALERT POINT-TO-POINT SERVICE

3.01 Four types of point-to-point service are available on the network during nonalert periods. These calls are operated as follows:

(A) Calls from a Base or Missile Complex to Headquarters or SAC

3.02 Operation of the nonlocking signaling key at a Base or Missile Complex Command Post will transmit the long pulse line signal. This signal will operate a flashing lamp at all multiple positions at Headquarters or SAC. Operation of the TEL key in any receiving position will change the lamp operation in that position to a flutter (TALK condition) and the lamps in all other positions to a steady or BUSY condition. The operator at Headquarters or SAC may disconnect by operation of the position TEL RLS key.

(B) Calls from SAC or Headquarters to a BASE or Missile Complex

3.03 The operator connects the position telephone to the circuit by operation of the circuit TEL key. The associated lamp at that position will flutter to indicate the TALK condition. Circuit lamps in all multiple positions become steady to indicate BUSY. Signaling to the Base or Missile Complex Command Post is by voice through the Base or Missile Complex loudspeaker. At the end of the call the position telephone at SAC or Headquarters is disconnected by operating the position TEL RLS key or by the operation of any circuit TEL key to pick up another circuit.

(C) Calls between SAC and Headquarters

3.04 Signaling from SAC to a Headquarters is by voice via the associated loudspeaker at the Headquarters location. Signaling from Headquarters to SAC is accomplished by operation of the TEL key associated with the SAC circuit followed by operation of the SAC SIG key. Position circuit lamp will flutter and other positions show BUSY.

3.05 The signal when received by SAC will show a flashing light in all positions. When answered at any position by operation of circuit TEL key that position light will flutter and all other position lights indicate BUSY by a steady light. At end of call the telephone set is disconnected by operation of the TEL RLS key or TEL key of any other circuit.

(D) Conference Call from a Base to SAC and Headquarters

3.06 A Base may, if desired, transmit simultaneously to SAC and its associated Headquarters. A nonlocking "Line GRP" key is provided with the handset associated with each circuit. To use the conference arrangement, the operator must remove either handset from its cradle and momentarily operate its associated "Line GRP" key. SAC and Headquarters are signaled as described in Par. 3.02. Returning the handset to its cradle restores the circuits to normal operation.

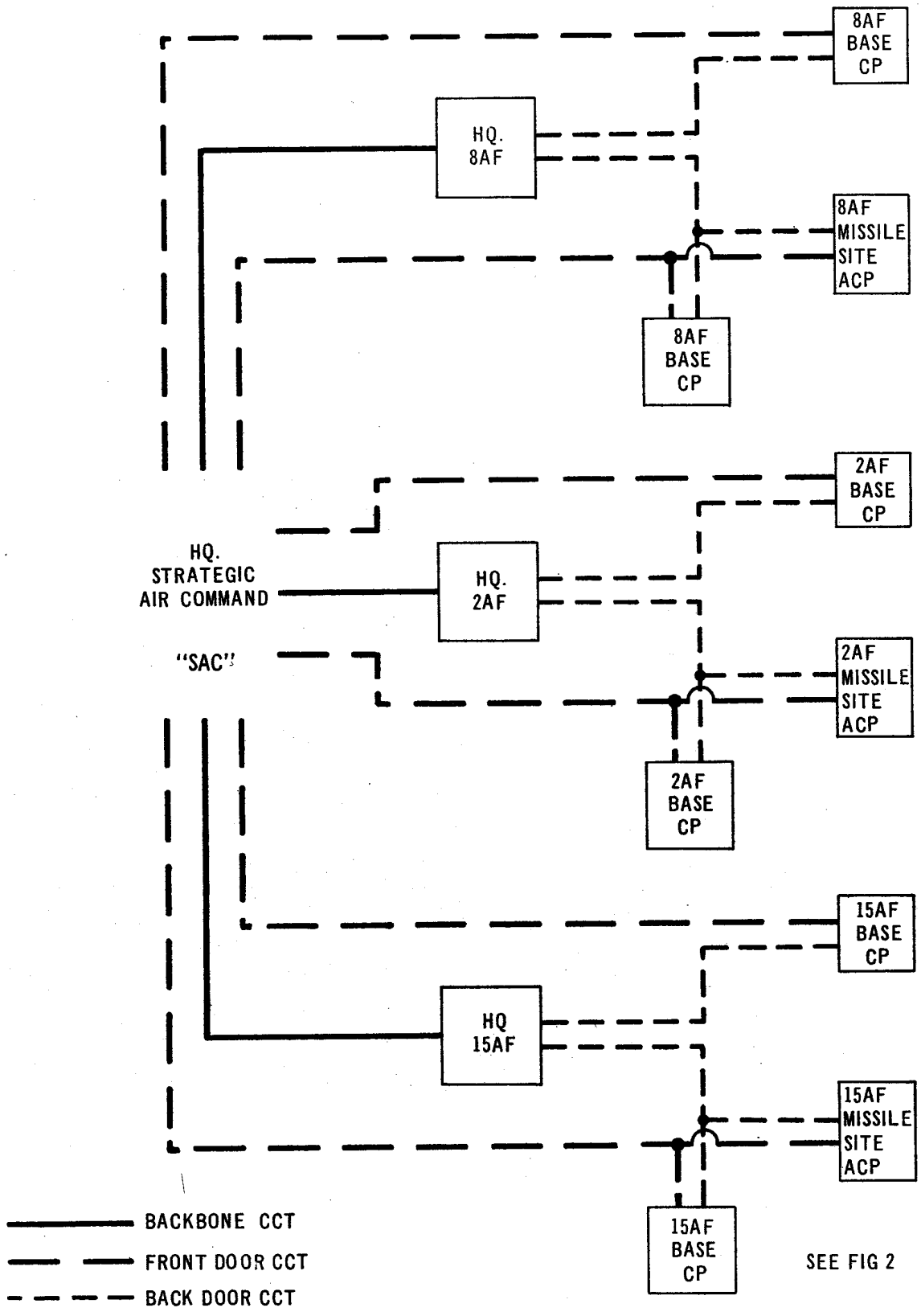

Fig. 1 – Block Diagram of Primary Alerting System

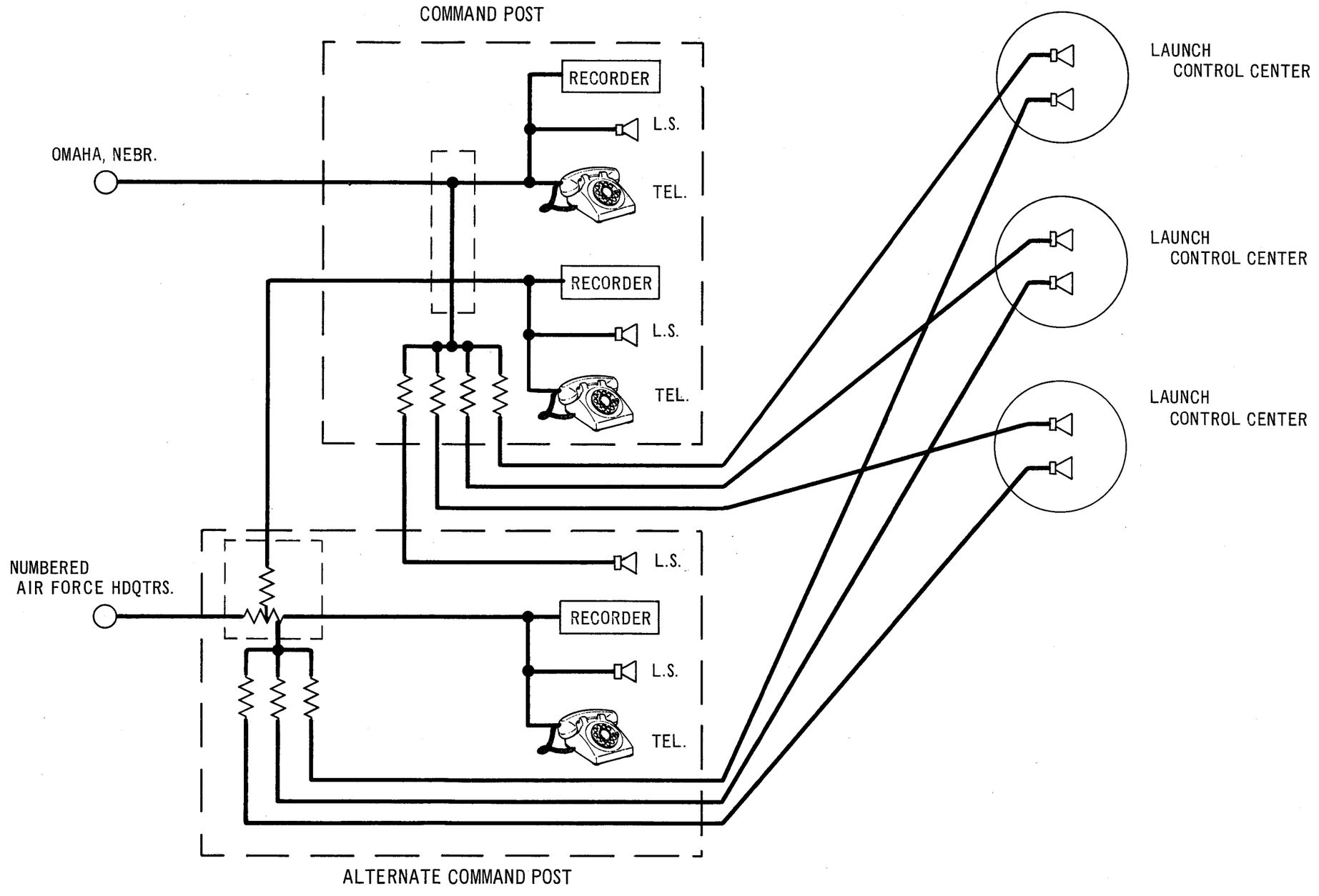

Fig. 2 – Termination of Primary Alerting System at Missile Sites

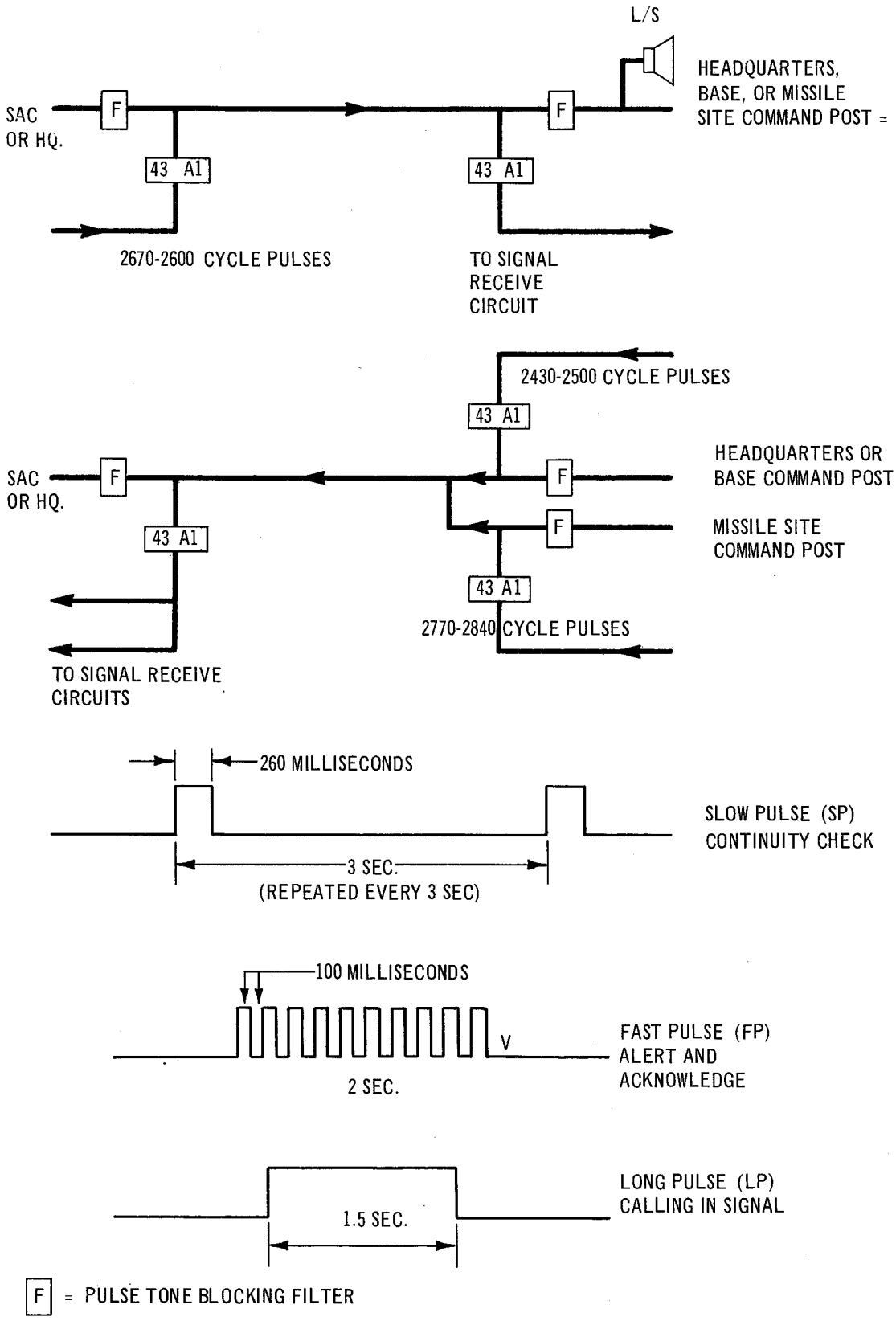

Fig. 3 – Signaling Arrangements

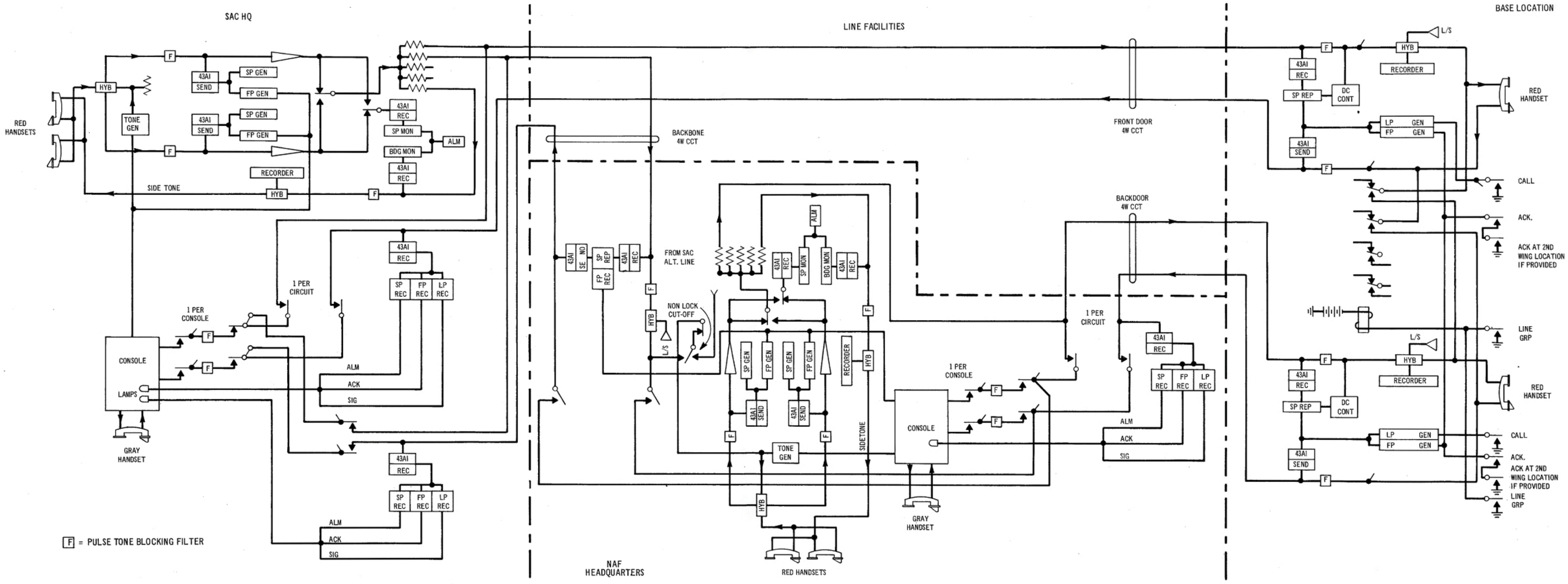

Fig. 4 – Schematic Diagram of Primary Alerting System