CUSTOMER MISCELLANEOUS EQUIPMENT SERVICE
CIVIL AIR RAID WARNING SYSTEM
BELL AND LIGHT SIGNAL - PUBLIC ALARM SIGNAL CONTROL

1. GENERAL

1.01 The revision of this section has been made necessary by a recent Civil Defense Administration directive which changes from color (yellow, blue, red, white) to numerical code (1-2-3-4 the designations of the various alert conditions. Also included in this issue is a description of a new station numbering system which makes possible machine billing for these services.

1.02 The CARW, Civil Air Raid Warning system consists of a group of BL, bell and light stations and BS, public alarm signals, which disseminate alert and alarm signals to important buildings and locations. Such signals are under control of a keypoint or one or more alternate keypoint stations.

1.03 CARW alerts originate in the ADCC, air defense control centers, which are operated by the U.S. Air Force. There are at present seven such centers in the U.S.A. Personnel of ADCC, transmitting over a private line network, alert the personnel at keypoint civilian air raid warning stations which are sponsored by the FCDA, Federal Civil Defense Administration, and usually are manned by local civilians. From these civilian keypoints, alerts and alarms may be sent out over the CARW network to subkeypoints and to the several BL and BS stations in a city, county, or larger geographical area.

1.04 Reference in this section to "Station" shall be considered to be the line termination and equipment located on the customer's premises whereas "Station Line Circuit" is the line circuit termination on the Central Office CARW equipment.

2. DESCRIPTION AND OPERATION

2.01 In each central office of an exchange where there is customer demand for BL and BS service, terminal equipment will be installed. Such equipment will usually be mounted entirely within a single bay and will consist of:

2.0101 Individual line circuits for BL stations.

2.0102 Individual line circuits for BS stations.

2.0103 Common equipment to furnish power supply, alarms and signal controls.

2.0104 Test and talking facilities.

2.0105 Repeaters for receiving and sending signals to other central offices and repeaters for receiving control station dial pulses.

2.02 The wire facilities that interconnect a keypoint with alternate keypoint stations in a given area are known as the backbone network. Such a network may be interconnected to the backbone network of other areas using special intercity DC signal facilities.

2.03 Referring to the sketch of a typical CARW backbone network, SEATTLE, WASHINGTON, which is a part of this practice, it will be noted that a KEYPOINT (control) station is shown connected to the PARKWAY Central Office. The station equipment consists of a simple dial and mounting case. The dial has only five finger holes which are designated: STOP, TEST, ALERT, TAKE COVER, LISTEN TO RADIO. Also, at this station there is a BL station set which is a small case containing a ringer and four cold cathode tubes with lenses numbered 1, 2, 3, 4.

2.04 Assuming that personnel at the control station receives information via the ADCC of such content as to justify alerting the surrounding country of a probable air attack, the attendant would unlock the cover protecting the dial and dial "ALERT" twice. This would pulse the one-way receiving equipment in PARKWAY office which in turn would repeat the pulses to all other repeaters connected in the backbone network, as well as repeaters in other cities which are connected to the backbone network. The repeaters

so pulsed would in turn cause each associated receiving and distributing unit to energize and send out the 2 (ALERT) code to all BL stations. At all such stations, the No. 2 light and associated bell would operate on a cycle of .5 seconds on, .5 seconds off, .5 seconds on, 2.5 seconds off, and continue to repeat this code until the attendant at the control station or alternate control station dials STOP. If an air attack were imminent, the control station would dial TAKE COVER - TAKE COVER (each code except STOP must be dialed twice) and the function would be the same except that in addition to the BL station operation, equipment in the central offices would be energized that would operate all public alarm signals that are connected to the system (siren, horns, etc.). The code in this case would be a warble effect by virtue of a continuous code of .5 seconds on, .5 seconds off, etc. The control station may change any code to another one by dialing STOP followed by dialing the code of the signal wanted. A bell and light set located near the control dial will provide the attendant with a verification of the signals being sent to all stations.

2.05 Code used on backbone networks of six or more stations (1 to 200 size):

TEST-TEST	- 2 Bell Code on BL stations only.
ALERT-ALERT	- 3 Bell Code on BL stations. 3 to 5 minute sirens on BS stations.
TAKE COVER TAKE COVER	- Continuous short bells on BL stations - warbling sirens on B.S. stations.
LISTEN TO RADIO- LISTEN TO RADIO	Long ring on BL stations only.
STOP	- All signals stopped, also dialed before changing from one code to another.

2.06 Code used on systems of 1 to 5 stations (BL service only).

TEST	- Continuous Ring Signal
ALERT	- Continuous Ring Signal
TAKE COVER	- Continuous Ring Signal
LISTEN TO RADIO	- Continuous Ring Signal

2.07 Two sizes of central office receiving and distributing units may be provided. The 1 to 5 station unit is designed to take care of small towns. This unit requires two pairs of wires to each station. Regular ringing current is used to operate the station equipment (see 2.06). Test jacks and test equipment are not provided; therefore, testing will be done on M.D.F. shoes in the regular way.

2.08 The large size CARW with an initial unit of 50 lines may be added to in units of 50 up to a maximum of 200 lines. Any number of the 50 and/or 200 units may be interconnected in the same backbone network using combinations of several types of repeaters. Lines of the basic unit (1 to 50) may be arranged, by a wiring change, to prevent some signals from reaching stations restricted. Take Cover and Listen to Radio Signals cannot be restricted from any stations.

2.09 Public alarm signal line circuits (BS) associated with each receiving and distributing unit may be provided in each central office in any quantity up to a maximum of 30. These line circuits energize when an Alert or Take Cover signal is dialed by the control station attendant. Telephone Company will provide regular standard 20 cycle subscriber equipment on these loops and existing practices and limitations pertinent to such equipment shall apply. For example, if a customer prefers to manually operate and control his siren or whistle equipment, we might furnish only a regular ringer and 21B type visual signal. On the other hand, if customer wants his siren, whistle or horn to be under control of the control station attendant, we would furnish a standard outdoor type relay set (KS-7341) which, when energized would in turn operate the customer's equipment. The central office line circuit equipment has been provided with optional wiring to vary the length of the ON-OFF period of 20-cycle current applied to lines in order to compensate for customer-owned large motors that require longer time intervals to attain full speed. The Telephone Company will furnish only one station relay set per line.

2.10 Signal grade loop facilities interconnecting repeaters of the several offices in a backbone network, and the control station loop shall not exceed 1500 ohms each. Ordinarily such facilities will be authorized and assigned on an P.L.S.O. order by the Toll Service Supervisor. Existing practices and procedures on P.L.S.O. orders shall apply.

2.11 Control or alternate control dial station equipment for desk mounting will consist of a dial set with number plate holder and will be ordered and recorded as: DIAL STATION ASSEMBLY PER JN4141-L1. For wall mounting these sets consist of a dial set, backboard and number card holder: DIAL STATION ASSEMBLY PER JN4141-L2. See Paragraph 2.10 for loop limits.

2.12 Stations requiring audible signals only will use standard: SUBSET 531A-3. BL stations require a modified 531A set ordered and recorded as: STATION SIG IND. ASSEM. JN4141-L3. This listing provides a BL set mounted on a backboard with number card holder. The BL station with backboard, number card holder and bell cutoff key (6017C) is listed as: STATION SIG. IND. ASSEM. JN4141-L5. The listing; STATION SIG. IND. ASSEM. JN4141-L4 consists of a BL set mounted on a backboard along with a number card holder and a key (6017B) to cut off an extension station. See Tables A and B for loop limitations.

2.13 Public alarm signals (sirens, horns, whistles) may be controlled directly or indirectly from CARW networks. If direct control is specified, an outdoor type relay set KS-7341 or equivalent will be used and present assignment, installation and limitation practices will apply. If indirect control is used, the customer will manually operate his alarm equipment after receipt of a signal, usually from a BL station set or a bell connected to a BS line circuit.

3. SERVICE ORDERS

3.01 Intraexchange (exchange network) and interexchange (special channels between cities) facilities will be authorized by P.L.S.O. and/or circuit orders. Control and alternate control dial stations will be authorized by a regular exchange service order. Facilities for initial as well as subsequent additions or change of location of such stations will be covered by P.L.S.O. and/or circuit orders. Reference to the typical SEATTLE, WASHINGTON, layout will clarify the reason for this deviation from standard procedure. Facility numbering, designation, lineup, precautions and work operations will be in accordance with BSP A and E sections pertaining to private line and leased circuit services.

3.02 Subscriber services, including control and alternate control stations mentioned in 3.01, and including any company monitoring stations (except the BL set included by the Chief Engineer on each central office CARW test panel) will be authorized by a regular service order prepared and issued in the same manner as other private line telephone service except that mileage data will not be recorded because the established rate includes mileage, if required. Assignment of the basic station number, BL or BS service, will be made by the Commercial Department and entered on the service order before release to Plant. The prefix will be BL followed by a four-digit number. This number followed by the abbreviated city, name and prefix of the office in which the serving CARW equipment is located shall be entered in the "Station No." section of Instruction Card, Form GP-253. A station located in Seattle served from the Main office would, for example, have a number such as BL-3220 SEA. MA. To take this number apart the letters BL are assigned to both Bell and Light (BL) and Bell and Siren (BS) installations even though they are separate types of service. The four digits, in this case 3220, are selected from one of two groups of numbers 0001 to 4999 for commercial and state or local government services and 8000 to 8999 for Federal Government. The SEA. MA. is added to enable toll forces, when they receive a trouble report from a station, to quickly determine which central office to contact for tests. Interexchange services (station located in one exchange served from CARW equipment located in another) will have the digit 4 preceding the BL prefix, i.e., 4BL-3220, SEA. MA.

3.03 Channels from station equipment to the closest central office receiving and distributing unit will be provided in all cases without separate entry on service orders. Typical service order abbreviations and definitions applicable to BL-BS service are:

1 CARW B-L CONT D or 1 CARW BL CONT D ALT	Civil Air Raid Warning Bell and Light Control (primary) or subcontrol (alternate) station dial set. In addition to access information, the desired station location, and call telephone number, the orders shall clearly state the individual's name who is to receive the locking key provided with each such set. Order should also specify if desk or wall mounting is desired.
1 CARW B-L REC	BL station set per JN4141-L3 arranged to receive all signals 1-2-3-4.
1 CARW BL REC (Restrict 1)	BL station set per JN4141-L5 arrange central office line circuit to restrict test signals.
1 CARW B REC (Restrict Test)	Bell only station set, 531 A3. Standard backboard and 2A number card holder must be ordered separately for this type of station equipment. Arrange central office line circuit to send only Take Cover and Listen to Radio signals.
1 CARW B-S	Civil Air Raid Signal bell 684D. This type signal station could be used by customers who elect to manually control their own alarm system after receiving the air raid signal.
1 CARW PU B ALARM SIG RLY (WP Relay Set)	Civil Air Raid Signal outdoor type relay set KS-7341 (or equivalent) connected to central office public alarm signal line circuit. The low amperage (max. 5 amp.) contacts of this relay connect to customer-owned relays or equipment which control the operation of sirens, horns or whistles. Service order must specify the type, name plate data, full load rating and timing of OFF-ON requirement of the equipment to be connected by the customer to the telephone company owned relay.

3.0301 All service orders for BL or BS will show in the AC space the name of party on customer's premises who is authorized to direct placement of equipment. In the RMKS space of service order will be shown the telephone number closest to the proposed location of BL, Dial, or BS station set.

4. ASSIGNMENT

4.01 A Form E-4052 record shall be prepared for each central office having a CARW receiving and distributing unit. A separate Form E-4052 shall be prepared for each such office that is equipped with one or more BS line circuits. All line circuits should be listed in numerical sequence on the record. The station number of all working BL or BS line circuits shall be entered in the appropriate spaces of Form E-4052. Optional wiring data shall also be shown on such record in order that service orders may be assigned to provide proper restriction (see Paragraph 2.08) and timing (see Paragraph 2.09) wire options. Other information such as loop limits, designations of each wire on 4-wire stations (small office units) etc., useful to assignment work shall be entered on the record in the usual manner. The following notice shall also be placed on each BL and BS record sheet. WHEN LAST WORKING STATION IS DISCONNECTED, IMMEDIATELY PREPARE A REQUEST TO DISCONNECT C.O. EQUIPMENT PER M24.52.1

4.02 In assigning the station line circuit, select it from the record (see Paragraph 4.01) to keep the load on odd and even numbered circuits, equal or plus one. This would ordinarily come about if assignment were made in rotation starting with BL or BS line circuit 1 and 2-3-4, etc., for subsequent orders. However, if an extension station is placed on a line, it should be posted to the record and counted when computing the number of stations on odd and even line circuits. Number cards shall be prepared and attached to the IW copy of work orders.

Form GP-249 - Dial code plate for control station.

Form GP-250 - Instruction Card for control station.

Form GP-251 - (Number Strip 1-4) for all BL receiving stations.

Form GP-252 - (Code Designation Card) for all BL receiving stations.

Form GP-253 - (Instruction Card) for all BL receiving stations.

Form GP-253 - Or P-2241 with GP4W card holder may be used at all BS stations to identify station and provide trouble reporting information.

4.0201 The toll control or subcontrol office telephone number to be printed by assignment forces on GP forms in the space: TO REPORT TROUBLE, CALL will be determined by the Division Plant Manager. When the location of a station is such that toll charge would be incurred by a subscriber calling the trouble reporting number, the word: COLLECT should precede the listed number, i.e., TO REPORT TROUBLE, CALL COLLECT: SEATTLE MUtual 2-9690.

4.0202 Following is a representative list of toll control office telephone numbers:

Sta. in Seattle	- Seat.	MUtual 2-9690
Sta. in Renton	- Seat.	MUtual 2-9690
Sta. in Des Moines	- Seat.	MUtual 2-9690
Sta. in Kent	- Seat.	MUtual 2-9690
Sta. in Bremerton	- Seat.	MUtual 2-9690
Sta. in Port Orchard	- Seat.	MUtual 2-9690
Sta. in Auburn	- Seat.	MUtual 2-9690
Sta. in Tacoma	- Tac.	MArket 7-5156
Sta. in Puyallup	- Tac.	MArket 7-5156
Sta. in Sumner	- Tac.	MArket 7-5156

4.03 On the service order enter C OFC telephone number; this would be the switch room telephone number of the office containing the receiving and distributing unit. This telephone number is required by the installers and repairmen to test the station equipment.

4.04 Check RMKS to make sure the subscriber call number per 3.03 is listed. If not, P-102 to commercial for required information. This number must be posted on records (See Sections 5 and 6.)

4.05 Assign facilities in the regular manner consistent with loop limitations. In the LINE space enter the line circuit number and wiring options required to provide restricted signals as specified on the order.

4.06 All BL and BS facilities are classified as SPECIAL SERVICE LINES and will be treated in accordance with practices applying to such service.

4.07 Plant service center forces will prepare delayed order report, P-102, immediately upon receipt of a CARW service order under the following conditions:

4.0701 The first service order for BL or BS station service in a central office serving area shall be treated as follows:
Prepare P-102 to show facility make-up from central office to the station location, i.e., gauge and length of cable sections, type and length of open wire, approximate length of drop wire. If the P-102 is related to a control or alternate control station, also include information regarding work required to remove terminal bridges. The P-102 shall be forwarded to the supervising toll wire chief or district toll plant superintendent as appropriate who will immediately notify the toll service supervisor and arrange to forward copies of the P-102 to the toll service supervisor and also to the district plant engineer if outside plant facilities or removal of terminal bridging is required. This notification is required to start the rearrangement of toll facilities via circuit orders and/or P.L.S.O. orders which, when completed will bring the new central office serving area into the CARW network.

4.0702 Subsequent service orders for BL and or BS stations (received after the first order) will be P-102'd only when Outside Plant facilities are not available or available facilities exceed resistance limits. P-102's should be processed in the same manner as other exchange service.

4.08 Control or alternate control dial stations shall be served by facilities that are clear of bridged terminals. The terminal from which the drop or inside wire feeds shall be given SSM treatment.

4.09 CARW service orders after assignment and station number cards are prepared, will be distributed and processed in the same manner as other exchange service orders.

5. CENTRAL OFFICE

5.01 A jumper shall be run from cable pair to proper line circuit as specified on the frame copy of the service order. Lugs and jumpers will be given special service line treatment after which the service order will be initialed and passed to the chief switchman or equivalent supervisor.

5.02 The chief switchman will arrange for restriction or timing wire changes, designations for bridging jacks to show line number, posting of record book on the test panel to show line number, customer's name, wiring option used, customer's telephone number (see 3.03) date, time and initials of craftsman doing this work. The work order will then be initialed and returned to the craftsman to route in the usual manner.

5.03 When a call is received from a field craftsman on the regular switch room telephone asking for a test on a BL station, the central office craftsman will ask him for the telephone number of the station located within viewing distance of the BL station. Central office craftsman will then proceed to the CARW bay and using the telephone on that bay, call the field craftsman. Central office craftsman will then verify the receiving station (BL or BS) number, customer's name and telephone number, with the field craftsman. Central office craftsman will then plug the test cord of the test panel into the proper line bridging jack, will operate 1, 2, 3 or 4 test keys in accordance with the type of signal to be tested and will then press the nonlocking TEST key and check with the field craftsman as he does so, to verify that the proper lamp lights and station bell rings as long as the TEST key is depressed. Central office craftsman will continue to test with the field craftsman until station equipment operates properly. Field craftsman will then enter central office craftsman's name on the work order or repair order and call the service order desk or test desk to report completion of the service order or repair order.

5.04 Civil defense people may periodically make systemwide tests to determine that all BL and BS signals operate properly. To supplement such tests or as a result of such tests, telephone company initiated routine of station receiving equipment may be authorized by the District Plant Manager. To make such routine tests the central office craftsman using the call line on the CARW bay will call the telephone number listed as nearest to a given station receiving set and inform the party who answers that a test of BL signals is to be made. Also ask the party who answers to inform others that may be within sight or hearing of the receiving station to not be alarmed. Then using the test cord in the proper station bridging jack, ring each signal and check results with the customer. If all signals are received by the customer, thank him for his cooperation and inform him that the test is finished and signals received after that will have meaning. Hang up and proceed to the next entry to be tested. If trouble is encountered, report details to the Plant Service Center forces.

5.05 No special precautions are necessary when using test panel equipment in connection with station bridging jacks as in 5.04 but before any work, including equipment cleaning, is done on bay equipment or associated wiring, repeaters or cable pairs associated with repeaters, it will be necessary to call the appropriate toll control or subcontrol office for authorization.

5.0501 If maintenance tests are deemed necessary on the network circuit from any central office

receiving and repeating unit, or the control station, such request must first be made to the toll control office. The toll control office will alert all central office personnel concerned on the network and when satisfied that measures have been taken to prevent any false signals from being transmitted on the network out to BL and BS stations, authorization may be given.

5.0502 Procedure for "test 9" as covered in other "A" section is quoted in part: "There is a provision in the equipment for testing the network on an overall basis by using 9 as the test digit. When a 9 is transmitted upon the system it will bring the GREEN test digit lamp TST at each central office dial pulse receiving unit. This will give an indication to the operating and maintenance personnel that the system is in working order." A 204.526 #49

5.0503 At any time, in the event a false signal such as Alert or Take Cover is known to have been accidentally transmitted over the network to the public signal receiving and siren stations, dial STOP as quickly as possible then immediately following call the toll control office and explain the situation.

5.0504 Receiving and distributing units may be modified to provide a beehive type guard lamp to advise central office maintenance forces that the circuit has been left in an abnormal condition following a test, that is, the control or subcontrol dial station failed to complete a test cycle (one not ending in STOP). The "wrong digit" or "incomplete cycle" guard alarm can be retired manually by each office but this MUST NOT BE DONE unless such instruction is received from the toll control office. The toll control office upon being advised of an "incomplete cycle" alarm will contact civil defense authorities and verify the intent of the control station, and will urge that equipment be restored to normal by sending a STOP signal from the control or subcontrol dial.

5.06 The telephone number of the toll control or subcontrol office and appropriate warning information shall be stenciled on the protective covers of every CARW equipment bay. (See Paragraph 4.0202.)

5.07 In some cases the toll control office of a network may deem it advisable to have all RCO keys operated and all L1 relays blocked nonoperated on all CARW bays of the network. In this case it will be necessary for the toll control office to call the switchroom of each central office on the network to arrange for the blocking and ultimate restoral of the CARW equipment.

5.08 The backbone network facilities are equipped with permanent test features so that shorts, opens or grounds will cause an immediate alarm to sound and the defective section will then need to be removed from the network. The receiving repeaters connected to control or alternate control station dials are equipped to provide an alarm signal when the dial is operated as a call to attention, in order that central office personnel may observe for proper operation of equipment during actual usage.

5.09 The BL set located on each CARW bay shall be patched to an unassigned line circuit at all times when the test panel is not in use.

6. PLANT SERVICE CENTER

6.01 Card records shall be prepared in accordance with practices pertaining to private line service. PRIVATE LINE NO. will be the BL number shown on the service order. Control or alternate control station equipment shall be entered on the same card as the associated BL receiving station equipment; CONTROL or ALT. CONTROL as appropriate shall be entered on the card above the BL number. Data on the service order such as wiring options, customer's telephone number shall be posted to the card record in addition to regular entries.

6.02 Twenty-four hour maintenance practices apply to all BL, BS and SC (intraexchange signal circuits). SC facilities between offices will be authorized by P.L.S.O. and/or circuit order. The record and maintenance of such circuits are the responsibility of the several plant service centers. Each plant service center shall prepare a

master card showing the backbone network or that portion thereof in which full or joint responsibility is vested. The master card may be prepared using the legend prescribed on the typical SEATTLE, WASHINGTON layout shown in this section. For handy reference the card should be filed in front of BL and BS line cards. The toll control office shall be notified immediately when trouble develops on any portion of the network.

6.03 Regular trouble reporting, clearing, and coding practices apply to BL and BS services.

6.04 Station testing of BL service for the large units (over 5 lines) will be done from the CARW equipment bay (see Part 5).

6.05 Testing of all BS station relay or signal sets shall be done on regular test desks using M.D.F. test shoes and regular ringing current available on test desks. Before applying ringing current to such lines be assured by the field craftsman that customer-owned or company-owned sirens, horns, or whistles are disconnected from the station relay set.

6.06 Regulations applying to this service are subject to frequent and immediate change. For this reason it is deemed advisable to have but one point of contact between subscribers, civil defense people and the telephone company. The telephone company's daily service log in each warning area will be maintained by the toll control of subcontrol office as defined in Paragraph 4.02, which will also be the point of contact for subscribers, and civil defense people. There may be times when a subscriber will inadvertently call the regular exchange repair service in place of the number listed on the station number card. In this event the call should be accepted and passed immediately to the toll control or subcontrol office. Trouble reports received from the toll control or subcontrol office, employees or subscriber should be handled as for any other special service private line except that when a trouble report is closed the result of the investigation, test, or repair action shall be reported to the appropriate toll control or subcontrol office.

6.07 Telephone company employees will not originate, or permit others to originate warning signals from points other than the control or subcontrol station dial. Persons purporting to have authority to make such requests, regardless of the reason (control station out of order, emergency, etc.) shall be referred to the toll control office. Tests on individual local station or test directed by the toll control office are permitted as specified in this practice. False operation of any station signal (BL or BS) shall be reported in accordance with procedure applicable to ABNORMAL PLANT CONDITIONS.

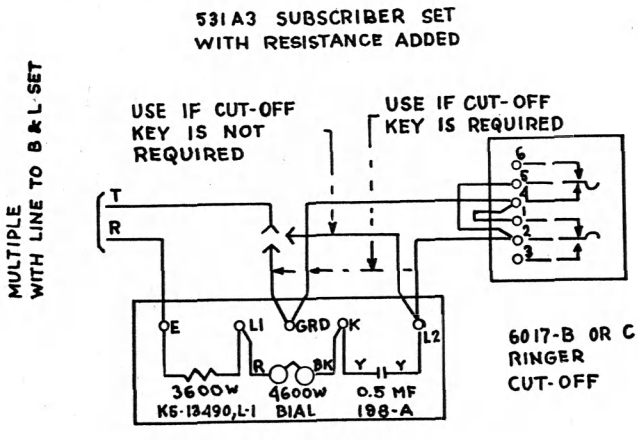


FIG. A
EXTENSION BELL

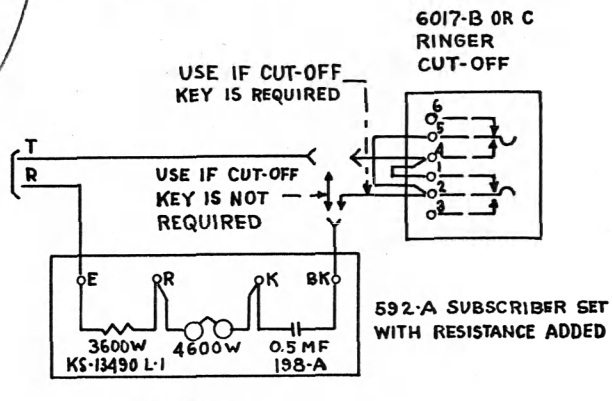
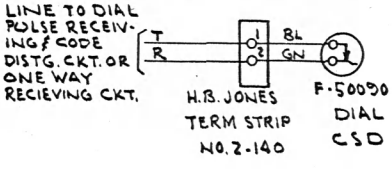
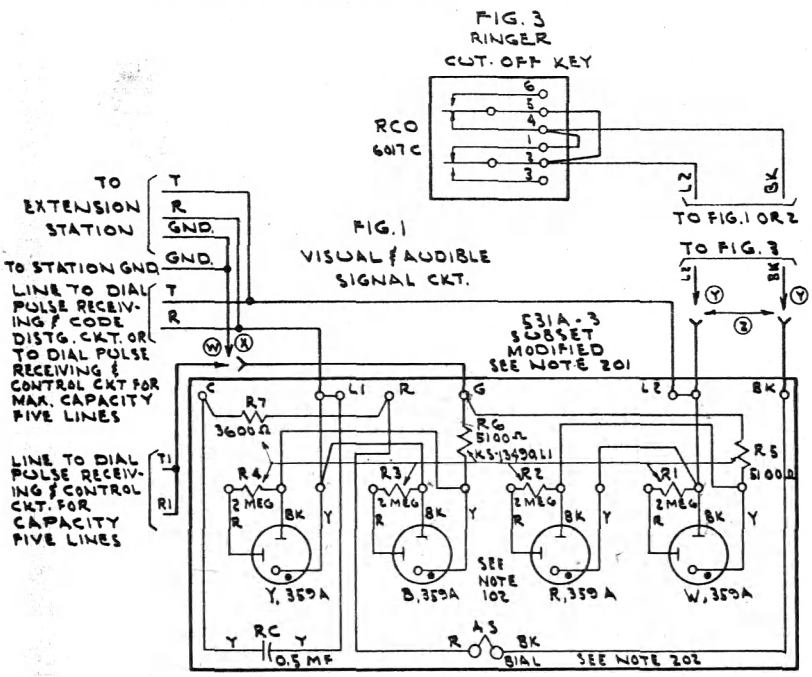


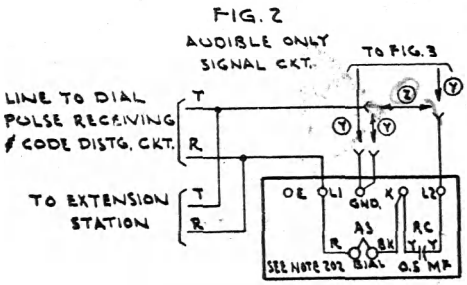
FIG. B
EXTENSION LOUD RINGING BELL

FIG. 4
CONTROL STATION DIAL



STATION SIGNAL INDICATOR CIRCUIT





Eqpt. Notes:

201. The 531A-3 subset, Fig. 1, shall be modified in accordance with ED-69231-01.

202. Dial ringers shall be equipped with 2-41B gongs and 101A gong attachments with knockouts removed.

A - One extension BL signal indicator, extension bell (Fig. A), or extension loud ringing bell (Fig. B) may be provided in addition to the main BL set where loop resistance does not exceed limits in Table A.

B - 3600 ohm resistance shall be in series with condenser and ringer in all cases.

C - Cut-off keys to silence the only ringer shall be NON-LOCKING (6017C).

D - Bias springs of all ringers shall be set at minimum tension.

TABLE A

Loop made up in part of open wire or drop wire.

WITH 15,000Ω MIN. INS. RES.							
LINE TO CONN. CKT.	MIN. VOLTS AC	MIN. VOLTS DC	MAX. EARTH POTENTIAL	MAX. COND. LOOP NO EXTENSION	ONE EXTENSION INDICATOR *	ONE EXTENSION RINGER	TWO EXTENSION RINGERS *
2-WIRE	65	45V.	0	600	50	300	200
	70	45V.	0	1300	400	700	600
	70	45V.	±5	800	150	400	200
	70	45V.	±10	300			
	75	45V.	0	1800	800	1200	1000
	75	45V.	±5	1300	400	800	600
	75	45V.	±10	900	200	400	300
	80	45V.	±10	1300	400	900	700
4-WIRE	65	45V.		500		200	100
	70	45V.		1000	200	500	400
	75	45V.		1500	600	1000	900

TABLE B

Entire loop in cable and inside wire

WITH 50,000Ω MIN. INS. RES.							
LINE TO CONN. CKT.	MIN. VOLTS AC	MIN. VOLTS DC	MAX. EARTH POTENTIAL	MAX. COND. LOOP NO EXTENSION	ONE EXTENSION INDICATOR *	ONE EXTENSION RINGER	TWO EXTENSION RINGERS *
2-WIRE	65	45V.	0	1000	200	600	200
	70	45V.	0	1800	700	1200	700
	70	45V.	±5	1300	300	800	400
	70	45V.	±10	600		300	
	75	45V.	0	2600	1000	1700	1200
	75	45V.	±5	2000	700	1300	800
	75	45V.	±10	1600	400	800	500
	80	45V.	±10	2400	800	1500	900
4-WIRE	65	45V.		800	100	500	300
	70	45V.		1500	400	800	700
	75	45V.		2000	700	1500	1100

*The addition of an extension indicator or two extension ringers will reduce by one the number of lines which may be served by a given central office unit.

Working limits in TABLE A and TABLE B are based on the use of 13C or equivalent resistance lamp in series with the ringing supply. Loop resistances shown apply to the most distant indicator or ringer.

CIRCUIT NOTES:

101

FEATURE OR OPTION		PROVIDE FIG.	PROVIDE APP'D OR WIR.	QUANTITY
VISUAL & AUDIBLE SIGNAL CKT.		1		1 PER STATION
AUDIBLE ONLY SIGNAL CKT.		2		1 PER STATION
RINGING CUT-OFF KEY		3		1 PER STATION
RINGING CUT-OFF FEATURE	REQ.		Y	
	NOT REQ.		Z	
CONTROL STATION DIAL		4		1 PER CONTROL STATION
CONNECTING CIRCUIT	DIAL PULSE RECIEV. ING & CODE DISTG. CKT. (2-WIRE OPERATION)		X	
	DIAL PULSE RECIEV. ING & CONTROL CKT. FOR MAX CAPACITY FIVE LINES (4-WIRE OPERATION)		W	

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SIGNAL (VISUAL)	2-WIRE OPERATION RINGING SUPPLY	2-WIRE OPERATION RING G. ON	4-WIRE OPERATION T. ON	4-WIRE OPERATION RING G. ON
YELLOW	± ON R	T	R	T, T1, R1
BLUE	± ON R	T	T, T1, R1	R
RED	± ON T	R	T	R, T1, R1
WHITE	± ON T	R	R, T1, R1	T

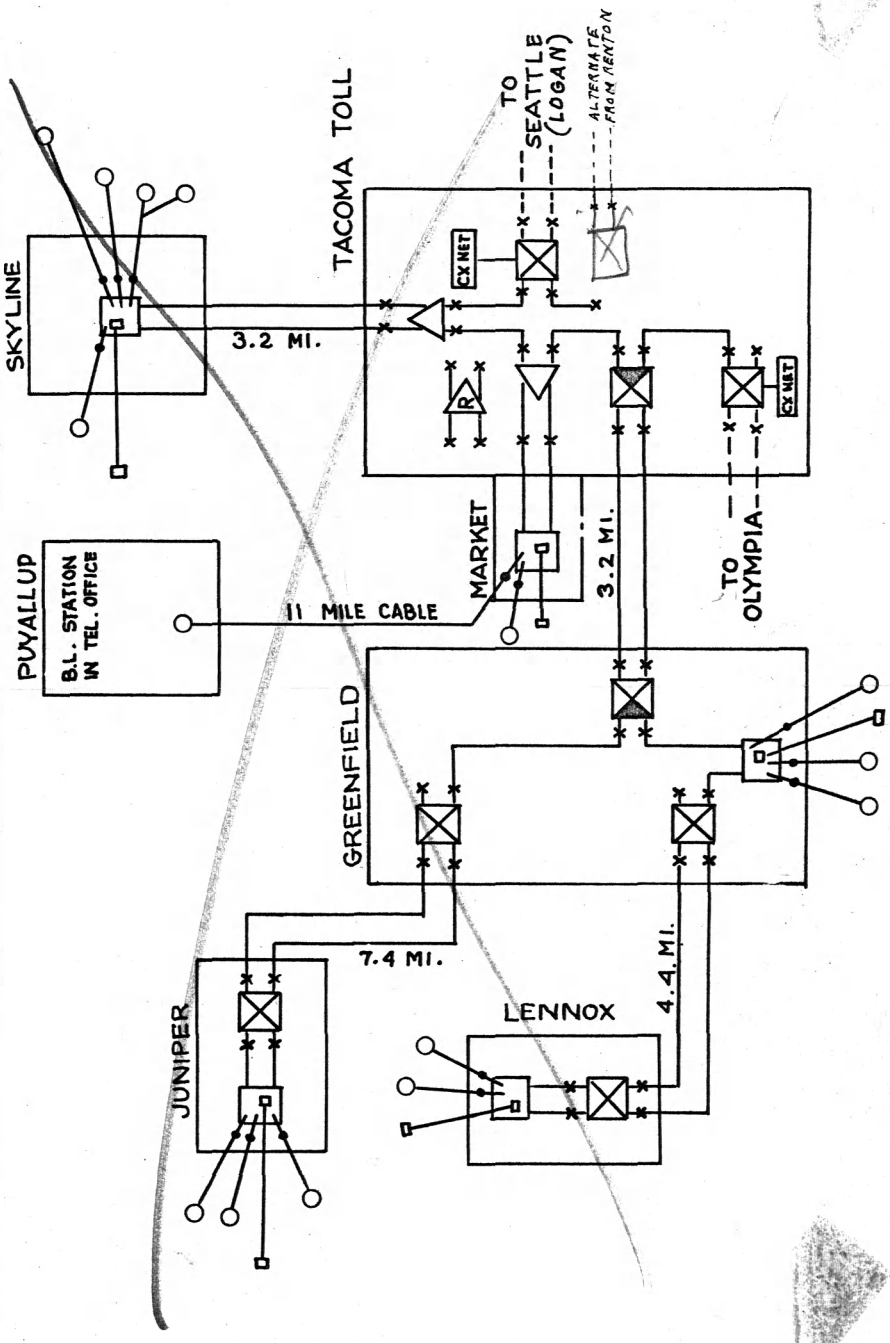
SECTION A399.401
SECTION F23.916.10
SECTION M25.95.10

LEGEND

- 1-Way Sending Ckt. SD-95683-01
- 1-Way Receiving Ckt. SD-95683-01
- Receiving & Distributing Unit
- 2-Way Sig. Rept. Bal. Loop SD-95681-01
- 2-Way Sig. Rept. Open & Closed Loop SD-95682-01
- CX NET Net for CX Lines SD-95687-01
- Patching Jacks
- Bridging Jacks for Testing BL Stations
- BL Station
- Toll Facility
- Bridged Station - Max. one per line when voltage res. limits permit
- BS (Siren) Control

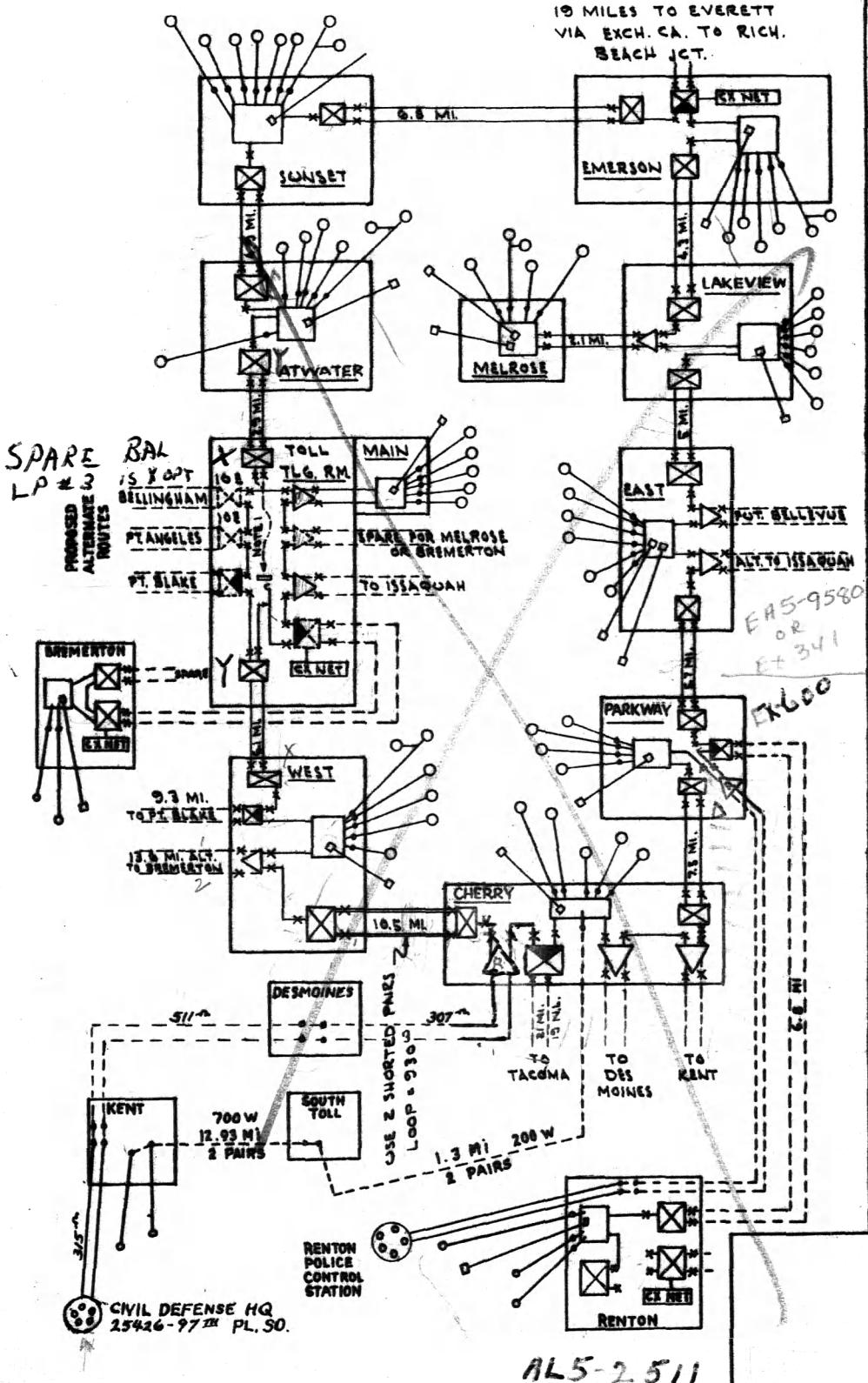
REFERENCE

SD-95684-01
SK-TR3849



CADW SYSTEM
TYPICAL NETWORK
(TACOMA, WASHINGTON)

SECTION A399.401
SECTION F23.916.10
SECTION M25.95.10



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- BL Station
- Toll Facility
- Bridged Station - Max. one per line when voltage res. limits permit
- BS (Siren) Control

NOTES

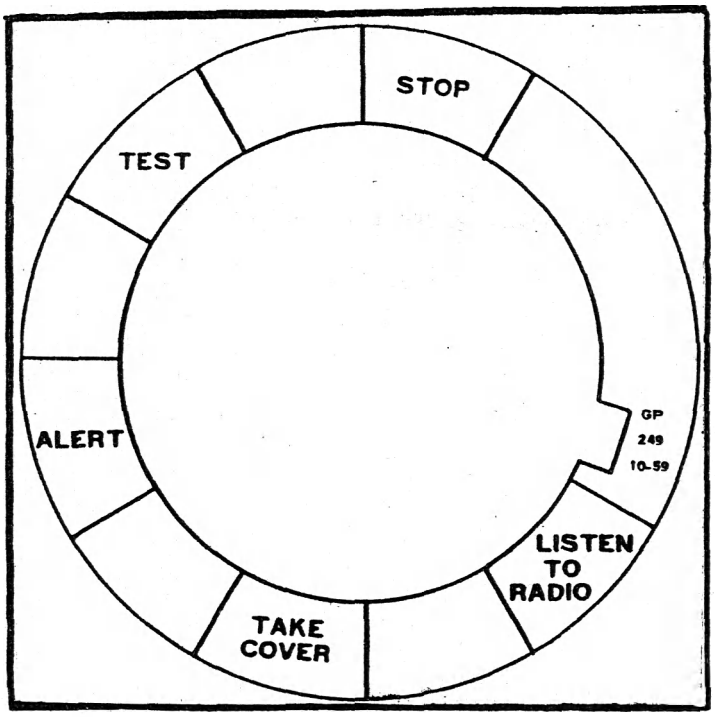
1. Atwater - toll leg terminated "stand by" to be patched in case continuity of regular Seattle network is disrupted.

KENT DIAL NOW FEEDS TO PARKWAY VIA CHERRY ON CABLE 6023 PAIRS 508 & 125 T&R SHORTED

CADW SYSTEM
TYPICAL NETWORK
(SEATTLE, WASHINGTON)

SECTION A399.401
SECTION F23.916.10
SECTION M25.95.10

FORM GP-249 (Reduced)
CONTROL STATION, DIAL CODE PLATE



FORM GP-250 (Reduced)
CONTROL STATION, INSTRUCTION CARD

BELL AND LIGHTS CONTROL STATION (DIAL)

DO NOT FORCE OR RETARD THE ROTATION OF THE DIAL

ACTUAL WARNING

"2" ALERT WARNING

1. Dial "Alert" Twice (Sirens Sound Alert Signal)
2. Wait 3 Minutes, Then Dial "Stop" once..
   (After Step 1 and 2 wait 1 Minute then repeat)

"3" TAKE COVER

1. Dial "TAKE COVER" Twice (Sirens Sound Take Cover Signal)
2. Wait 3 Minutes, Then Dial "Stop" once.
   (After Step 1 and 2 wait 1 Minute then repeat)

"4" LISTEN TO RADIO

1. Dial "Listen to Radio" Twice (Sirens Do Not Sound)
2. Wait 1 minute, then dial "Stop" once.
3. Wait 30 Seconds,
4. Dial "Listen To Radio" Twice
5. Wait 1 Minute, then dial "Stop" once.

TEST SIGNALS

"1" TEST SIGNAL

A. Partial - Bell and Lights Station Only
Send This Test Every Day at 10:00 A.M.

1. Dial "Test" Twice
2. After 15 Seconds Dial "Stop" once.
   (Since Sirens Should Not Be Sounded, Never Dial Alert or Take Cover on this Test)

B. Siren Test - Send this Test Every Wednesday at 12:00 Noon

1. Dial "Alert" Twice
2. Wait 1 Minute then Dial "Stop" Once

If Wrong Phrase is Dialed on Either the First or Second Pull, If Finger Slips While Dialing, or If Lamp Indicator Does Not Respond to the Phrase Dialed, Immediately Dial "Stop" Once, Then Dial Correct Phrase, Twice.

If Degree of Warning is Changed While a Warning is Being Transmitted, Immediately Dial "Stop" Once, Then Dial New Phrase Twice and Follow Instructions for That Phrase.

KEEP COVER LOCKED. Key Should be Used to Open Cover and Must be Used to Lock Cover. However, If Key Is Not Readily Available, Cover Can be Forced Open by Hand. Do Not Attempt to Close Cover Without Using Key.

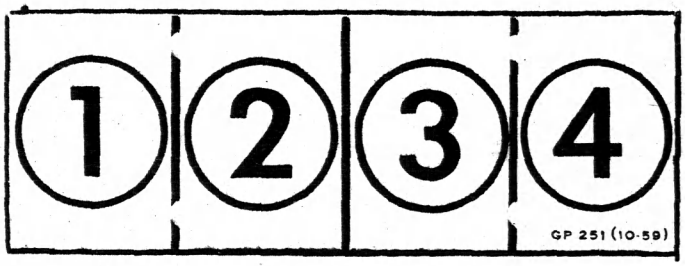
THIS IS STATION NO. _____ REPORT ANY SERVICE TROUBLE TO _____

The Pacific Tel. and Tel. Co.

Approved – State of Washington
Dept. of Civil Defense

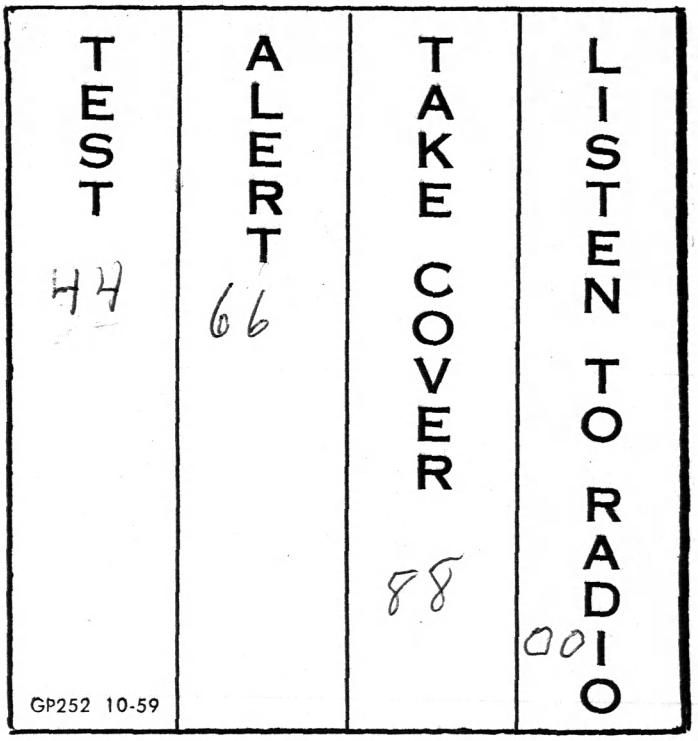
GP 250 (10-59)

FORM GP-251
Receiving Station,
Number Strip (1-4)



STOP OR
RESTORE —
2

FORM GP-252
Receiving Station,
Code Designation Card



T-005

FORM GP-253
RECEIVING STATION,
INSTRUCTION AND
NUMBER CARD