PRIVATE LINE TELEPHONE SERVICE
SAC PRIMARY ALERTING SYSTEM

CONTENTS

1. GENERAL

1.01 This section discusses the testing and maintenance of the SAC Primary Alerting System. A general discussion of the system and its operating features is covered in Section E47.251. Unless specifically covered in this section, testing and maintenance procedures should follow the standard procedures for similar 4-wire voice circuits.

1.02 Due to design requirements of the Primary Alerting System there is a minimum of jack and relay contacts in the voice alert transmission path. For this reason a number of tests at the customer locations must be made on a bridging basis. Special attention must be given to maintaining line facility continuity on all circuits. An interruption of 20 seconds or more will result in a visual and audible alarm at SAC or a Headquarters location. Standard procedures for office responsibility, protection of special circuits, and other operating routines as covered in the E12 series of these sections should be followed except as supplemented by this section.

CIRCUIT LINE-UP

1.03 Circuit order test instructions and transmission tests contained in the standard sections for the types of circuits involved should be followed in the line-up of all Primary Alerting System circuits except as supplemented in this section.

1.04 On all circuits between SAC, Headquarters or Base locations the net loss at 2700 cycles should not exceed the 1000-cycle net loss by more than 10 db in either circuit direction.

2. SAC AND HEADQUARTERS TESTING AND MAINTENANCE

GENERAL

2.01 At SAC and all Headquarters locations an over-all operations test can be made by the customer to check operation of all associated

line checking circuits, including the line failure lamps, at one time. A separate test will check all acknowledgment lamps at one time.

TRANSMISSION TESTS

(A) Alert Transmission Path (Refer to SD-1G116-01, Figs. 1, 2, and 20)

2.02 Tests in this part are to be made on an out-of-service basis. Section E37.250.0 should be used where applicable.

2.03 Test Apparatus as in Section E37.250.0, Part 5.

2.04 Adjust the gain of the two V3 amplifiers to the value specified on the Circuit Layout Card using a V3 amplifier test circuit.

2.05 Install the two amplifiers.

2.06 Block the T relay in the operated position in both SD Figs. 2. This will disconnect the output of each slow pulse generator from the associated 43A1 telegraph carrier channel.

2.07 Block the SW relay in the released position.

2.08 All, SD Fig. 20, bridge outlets, not under test, should be terminated in normally assigned 600-ohm equipment or a 600-ohm resistor.

2.09 Install the 89-type resistors in pad sockets A1, A2, and B as specified on the Circuit Layout Card.

2.10 At the location of the red telephone set, per SD Fig. 3, set up the test indicated in Section E37.250.0, Chart 4, Fig. 7, at the "Subscriber's Terminal." Connect a second transmission measuring set to a Fig. 20 outlet at the first jack appearance, which is the specified −13 or −16 db level point. Adjust the oscillator to send 1000 cycles at plus 6.7 db.

Requirements:

(a) The initial measured loss at the bridge outlet should be within plus or minus 1 db of the value specified on the Circuit Layout Card.

(b) The measured loss of each remaining SD Fig. 20, outlet should not deviate more than 0.3 db from the value obtained in (a).

(c) Assuming the requirements in (a) and (b) have been met, adjust the gain of the A amplifier, associated with the first SD Fig. 2, to obtain the specified −13 or −16 db level within plus or minus 0.1 db.

(d) The transmission level indicated on the measuring set at the "Subscriber's Terminal" should be within plus or minus 1.5 db of the value specified on the Circuit Layout Card after adjustment (c).

2.11 In Step 2.07, the SW relay was blocked in the released position. Change this and block it in the operated position. This will interchange the V3 amplifiers and associated equipment.

(a) The measured loss at the bridge outlet should be within 0.5 db of the value obtained in 2.10(a).

(b) Adjust the gain of the A amplifier associated with the second SD Fig. 2 to agree with 2.10(c).

2.12 At the red telephone set location, move the test equipment at the "Subscriber's Terminal" from SD Fig. 3 equipment, to SD Fig. 21 equipment, and repeat the test procedure of Steps 2.07, 2.10, and 2.11.

Requirements:

(a) The measured loss to the bridge outlet should be within 0.3 db of the value obtained in 2.10(c).

(b) The measured loss at the "Subscriber's Terminal" should be within 1.5 db of the value obtained in 2.10(d).

2.13 Remove the block from both T relays and SW relay, Steps 2.06, 2.07, and 2.11.

(B) Blocking Filters (SD-1G116-01, Figs. 1, 2, 11, and 18)

2.14 These tests are to be made on an out-of-service basis. Test each blocking filter on a bridging basis using 600-ohm impedance testing equipment. Adjust the test oscillator for a zero level output, at the frequency given in Table A, and connect it to Terminals 1 and 2 of the blocking filter to be tested. Connect the measuring set to Terminals 3 and 4. Vary the frequency of the oscillator slightly to obtain a maximum loss reading. The loss reading obtained should be more than 40 db.

TABLE A

NO.	SD FIG. QUANTITY SAC	HQ	FILTER DESIG.	CODE	FREQUENCY CYCLES
1	1	1	A	202E	2635
2	2	2	A	202E	2635
11	–	1	A	202E	2635
11	–	1	B	202F	2465
18	*	*	A	202E	2635
18	*	*	B	202F	2465

* One Fig. 18 is provided for each operator position.

(C) Nonalert Transmission Path (SD-1G116-01, Figs. 7, 8, 18, 19, and 20)

The following tests are on the common talking equipment, Fig. 18 for each two-way operator position:

2.15 Reference is made to Section E37.250.0.

2.16 Prepare a test arrangement as indicated in Section E37.250.0, Chart 4, Fig. 7, "Subscriber's Terminal," at the operator position to be tested. Connect a second transmission measuring set to an assigned, Fig. 20, outlet at the first jack appearance, the −13 or −16 db level point. Adjust the oscillator to send 1000 cycles at plus 1.7 db.

2.17 Operate the nonlocking TEL key associated with the bridge outlet that is connected to the second transmission measuring set. The reading obtained should be within 1.5 db of the −13 or −16 db specified on the Circuit Layout Card.

2.18 Send 1000 cycles at plus 4 or plus 7 db, the specified value on the Circuit Layout Card, from the corresponding receive jack on the circuit selected for test in 2.17. The reading on the transmission measuring set at the operator position, Step 2.16, should be within 1.5 db, of the specified value on the Circuit Layout Card.

2.19 Repeat tests per 2.16 to 2.18, inclusive, at all operator positions equipped with an SD Fig. 18.

43A1 TELEGRAPH CARRIER CHANNEL

2.20 With reference to Drawing SD-1G116-01, each 43A1 telegraph carrier channel unit should be arranged as shown at bottom of page.

2.21 Adjust the LP CUR control to approximately the mid-position.

2.22 Adjust the REC GAIN control as described in the following Parts (A) and (B).

2.23 All other tests and adjustments, where applicable, except as covered in the following Part A, should be made in accordance with Sections E24.263.00 and E34.263.00 and associated point sections.

(A) Slow Pulse Transmission and Monitor Units (SD-1G116-01, Figs. 1 and 2)

The following tests are to be made on an out-of-service basis as a part of circuit order tests or on a trouble basis. It is assumed that 1000-cycle transmission levels have been adjusted as covered in Part 2(A). The purpose of these tests is to adjust the SEN LEV of the 43A1 Send Circuits and the REC GAIN of the slow pulse 43A1 monitor receiving circuits.

APPARATUS

1 — Transmission Measuring Set

1 — KS-14510 Volt-ohmmeter, or an equivalent voltmeter

2.24 Connect a transmission measuring set to a Fig. 20, bridge outlet, at the first jack appearance at the specified −13 or −16 level point.

DWG. FIG.	NETWORK SEND	REC	SWITCH POS SEND	REC	*EQUIP TUBE SOCKETS
1	—	454M	—	L+	V3,V4,V5
2	453M	—	HM	—	V1,V2
6	—	454L	—	H+	V3,V4,V5
11	453L	454M	LM	L+	V1,V2,V3,V4,V5

* Tubes shall be removed from sockets not listed.

2.25 Block the SW Relay in the released position.

2.26 Block the U and S Relays in the operated position in the first SD Fig. 2. This will result in the transmission of a steady 2670-cycle mark signal.

2.27 Adjust the SEND LEV potentiometer on the associated SEND TRSG unit to give a reading on the transmission measuring set that is 5 db lower (more loss) than the specified level on the Circuit Layout Card.

2.28 Arrange the voltmeter for a maximum reading of not less than 150V dc. Connect the negative terminal to the ground Pin Jack G and the positive terminal to the LP Pin Jack of BRDG REC 43A1 Receiving Unit.

2.29 Adjust the REC GAIN potentiometer to the maximum counterclockwise position. Observe the minimum reading of the voltmeter. It should be approximately 10 volts.

2.30 While observing the voltmeter, slowly adjust the REC GAIN potentiometer in the clockwise direction to the point where the voltage suddenly increases to approximately 120 volts or more. This is the final REC GAIN adjustment.

2.31 In Step 2.25 the SW Relay was blocked in the released position. Change this by blocking the SW Relay in the operated position.

2.32 Repeat Steps 2.28 to 2.30, inclusive, with respect to the SP GEN REC 43A1 Receiving Unit.

2.33 Reverse the condition of Step 2.31 and block the SW Relay in the released position.

2.34 Observe that the transmission measuring set reading is the same value as obtained in Step 2.27. Then, adjust the SEND LEV potentiometer on the SEND TRSG 43A1 Unit of the first SD Fig. 2 to obtain a reading on the transmission measuring set that is within 0.1 db of the value specified on the Circuit Layout Card.

2.35 Remove the relay blocking tools from the U and S Relays in the first SD Fig. 2, Step 2.26.

2.36 Block the U and S Relays in the operated position in the second SD Fig. 2.

2.37 Reverse the condition of Step 2.33 and block the SW Relay in the operated position.

2.38 Adjust the SEND LEV potentiometer on the 43A1 SEND TRSG Unit, associated with the second SD Fig. 2, to give a reading on the transmission measuring set equal to that obtained in Step 2.34.

2.39 Remove the blocking tools from U, S, and SW Relays which were placed in Steps 2.36 and 2.37.

2.40 With Relays MB and MS operated and Relays SW and SZ released, short Leads T2 and R2 of the first SD Fig. 2, at Terminals 21 and 22 of the unit terminal strip C associated with the SW Relay.

Requirements:

(a) Relay MB should release within approximately 5 seconds and give an alarm.

(b) Relay SW will then operate.

(c) Within the next 3 seconds, Relay MB should operate followed by the operation of Relay SZ.

(d) Relay MS should release within approximately 5 seconds after the MB Relay reoperated. The alarm indication will remain and the No. 1 GEN FAIL Lamp will be on.

2.41 Remove the short from Leads T2 and R2 which was placed in Step 2.40. The MS Relay should then operate within approximately 3 seconds. This will remove the alarm indication. Relays SW and SZ will remain operated.

2.42 Next, short Terminals 11 and 12 on Unit Terminal Strip C, Leads T2 and R2 to the second SD Fig. 2.

Requirements:

(a) Relay MB should release within approximately 5 seconds and give an alarm.

(b) Relay SW will then release.

(c) Within the next 3 seconds relay MB should operate followed by the release of Relay SZ.

(d) Relay MS should release within approximately 5 seconds after the MB Relay reoperated. The alarm indication will remain and the No. 2 GEN FAIL Lamp will be on.

2.43 Remove the short placed in Step 2.41. The MS Relay should then operate within approximately 3 seconds and remove the alarm indication.

(B) Slow Pulse Receive Unit (SD-1G116-01, Figs. 6 and 11)

If the 43A1 Receiving Unit is not to be operated at maximum gain rotate the REC GAIN potentiometer to the maximum clockwise position and proceed with the following. These tests should be made as a part of circuit order tests or on a trouble basis, as required. These tests must be made on an out-of-service basis. It is assumed that transmission levels of the associated line facilities in both directions of transmission, are within the required transmission limits.

APPARATUS

1 — KS-14510 Volt-ohmmeter, or an equivalent voltmeter

1 — Attenuator

2.44 Arrange the voltmeter for a maximum reading of not less than 60 volts dc. Connect the negative terminal to Pin Jack G and the positive terminal to Pin Jack LP of the LINE REC 43A1 Unit. Slow pulses should be indicated at the rate of one per 3 seconds. The meter should indicate approximately 25 to 35 volts. When a slow pulse is received the meter will indicate its presence but will not indicate the maximum voltage of the pulse due to the short duration.

2.45 At a convenient jack appearance in the receive line of the 4-wire line facility, connect an attenuator in series with the receive line ahead of the 43A1 LINE REC Unit to be adjusted.

2.46 Adjust the attenuator for a loss equal to the specified maximum permissible line circuit level drop. This is the point at which the continuity failure alarm should operate. For example, if the specified maximum level drop is 10 db, adjust the attenuator for 10 db.

2.47 Observe the slow pulse indications on the voltmeter, which are at the rate of one every 3 seconds, while turning the REC GAIN potentiometer of the 43A1 Unit in the counterclockwise direction in small increments. Determine the potentiometer positions at which the slow pulses just drop out (No Voltmeter Indication). Then, adjust the REC GAIN potentiometer, by small increments, in the clockwise direction until slow pulses are again observed on the voltmeter. This is the final REC GAIN potentiometer setting. (Remove the attenuator.)

FAST PULSE GENERATOR (SD-1G116-01, FIG. 2 AND SD-1G120-01, FIG. 1)

2.48 The pulse speed, or frequency, and the per cent break adjustments are made by strapping resistors in associated resistor networks.

2.49 ***Apparatus:***

SD-96362-01 Pulse Checking Test Set

One 1W3A Cord or equivalent

2.50 ***Per Cent Break***

(1) Connect −48-volt battery and ground to the test set.

(2) With the lever-type key in the normal position, adjust the CAL rheostat to obtain zero on the per cent break meter scale.

(3) Connect the spade type tip of the 1W3A cord to binding post P. Connect the 347A plug to the fast pulse generator TST jack.

(4) Operate the lever-type key to the PCB position and observe the per cent break meter reading. The reading should be between 49 and 51 per cent. To meet this requirement, strap resistors R and S as described on the drawing.

2.51 ***Pulse Speed***

(1) Adjust the CAL rheostat per Step 2.50(2).

(2) Operate the SCALE key to the 20 position.

(3) Operate the lever-type key to the PPS position and observe the 0-20 pulses per second scale. The reading should be between 4.8 and 5.2 pulses per second. Strap resistors L, M, and N as described on the drawing.

2.52 Recheck Step 2.50 if changes are made in Step 2.51.

FAST PULSE RECEIVER (SD-1G116-01, FIGS. 6 AND 11)

2.53 This test uses SD-1G120-01, Figs. 1, 2, and 5, test circuit, which is part of the initial installation at SAC and Headquarters. The Figs.

2 and 5, test jacks, are mounted in bays containing fast pulse receivers.

2.54 ***Apparatus:***

SD-25707-01 Timing Test Set
Three 3P15A Patch Cords

2.55 This test must be made during a nonalert period after obtaining customer permission.

2.56 Adjust the MIL SEC switch on the test set to the 0-5000 position and the REC switch to the fifth clockwise position. Make the following patches with 3P15A patch cords:

(1) 48V BAT jack to 48V jack on test set.

(2) FP MEAS jack to TST 1 jack on test set.

(3) FP TST jack to FP TST jack on the fast pulse receiver to be tested.

2.57 Operate the test set BAT key to the ON position. After approximately 15 seconds, adjust the ADJ-0 potentiometer to obtain a zero meter reading.

2.58 Operate TST key to CAL and adjust the CAL potentiometer to obtain full scale deflection on the meter. Recheck the calibration preceding each test.

2.59 Operate the TST key to the OPR position. This will start the fast pulse generator. The meter pointer will advance until the fast pulse receiver operates. This should occur between 800 and 900 milliseconds. This will indicate that the receiver operated on the fifth pulse. Adjust the AC (Fig. 6) or V (Fig. 11) potentiometer as required to obtain this reading.

2.60 If the required reading cannot be obtained by adjusting the AC (Fig. 6) or V (Fig. 11) potentiometer, try replacing the cold cathode 313CC tube V4 (Fig. 6) or V5 (Fig. 11).

LONG PULSE RECEIVER (SD-1G116-01, FIG. 6)

2.61 This test uses SD-1G120-01, Figs. 3, 4, and 5 test circuit which is a part of the initial installation at SAC and Headquarters. The Figs. 4 and 5 test jacks are mounted in bays containing long pulse receivers.

2.62 ***Apparatus:***

SD-25707-01 Timing Test Set
Three 3P15A Patch Cords

2.63 Adjust the MIL SEC switch on the test set to the 0-5000 position. Adjust the REC switch to the fifth clockwise position. Make the following patches with 3P15A patch cords.

(1) 48V BAT jack to 48V jack on test set.

(2) LP MEAS jack to TST 1 jack on test set.

(3) LP TST jack to LP TST jack on the long pulse receiver to be tested.

2.64 Operate the test set BAT key to the ON position. After approximately 15 seconds, adjust the ADJ-0 potentiometer to obtain a zero meter reading.

2.65 Operate TST KEY to CAL and adjust the CAL potentiometer to obtain full scale deflection on the meter. Recheck the calibration preceding each test.

2.66 Operate the TST key to the OPR position. This will start the transmission of a marking pulse. The meter pointer will advance until the long pulse receiver operates. This should occur between 500 and 1000 milliseconds. Failure to meet this requirement may be due to a defective 313CC, cold cathode tube, V5.

SLOW PULSE RECEIVER (SD-1G116-01, FIG. 6)

The following tests are made on an in-service basis. The purpose is to determine if pulses are being received via the 43A1 telegraph carrier channel, and, if false pulses will give an alarm. Normally, false pulses would be the result of line noise, crosstalk, etc, at the receiving frequency of the 43A1 channel.

2.67 ***Apparatus:***

1 — KS-14510 Volt-ohmmeter, or an equivalent voltmeter

2.68 Arrange the test meter to receive a minimum of 150 volts dc. Connect the negative terminal to ground. Connect the positive terminal to SP IN pin jack on the panel under test. The meter will normally indicate approximately 7 volts for a period of approximately 3 seconds. Then, when a slow, 100 MS, pulse is received, the voltage increases to approximately 120 volts. The voltmeter is too slow to measure this peak voltage. However, it will indicate when a 100 MS pulse is received.

2.69 After determining that slow pulses are being received, connect the positive terminal of the voltmeter to pin jack SP OUT. Observe that slow pulses are being received. Next, momentarily operate the nonlocking SP TST key just before the next slow pulse is due. The pulse should be blocked, as indicated by the absence of a meter deflection. This tests the blocking circuit, consisting of tubes V2B and V3. If three legitimate slow pulses are missed, the A relay will release and give a CONT ALM at the customer location.

Caution: If the SP TST KEY is held operated for approximately one-half second the associated long pulse receiver will operate and signal the operator. If it remains operated 10 seconds, or longer, it will give a line failure alarm.

TUBE FAILURE ALARM (SD-1G116-01, FIGS. 1, 6, AND 15)

Normally, each 429A tube, in SD Figs. 1 and 6, is conducting approximately 2.8 seconds out of each 3-second slow pulse cycle. During the 0.2-second interval, the tube is nonconducting due to reception of a slow pulse. At this time the plate voltage rises to a maximum. These voltage spurts keep the associated alarm relay operated. If a tube fails, becomes nonconducting, the alarm relay will not release. For this reason the SD Fig. 15, tube alarm is provided.

2.70 ***Apparatus:***

1 — Tube Extractor, KS-14428 or equivalent

2.71 Remove the 429A tube from the socket, on the receiving panel to be tested. The tubes are designated as follows:

SD FIG.	ASSOC. WITH	DESIG.
1	BRDG Monitor	V2
1	SP GEN Monitor	V4
6	—	V1

Requirements: Approximately 1 second after a tube is removed the red neon ALM lamp on the receiving panel should start flashing and a visual and audible equipment room alarm will result.

2.72 Replace the tube in the socket. In a few seconds, after the heater has reached the required operating temperature, the tube will start operating and remove the alarm indications.

3. BASE TESTING AND MAINTENANCE

GENERAL

3.01 The general operating features of the Base in the Primary Alerting System are covered in Section E47.251. In addition, certain operating and testing features are provided at each Base location. A dc continuity checking circuit is provided on all local wing (station) receiving lines at each base. If a continuity failure occurs, it will interrupt the output of the slow pulse repeater at the base. This will result in an alarm at SAC or the associated Headquarters location.

3.02 The wing acknowledgment circuits are activated by the alert (fast pulse) signal which precedes a voice alert transmission. If there is more than one wing at a base, all wings must operate an ACK key before a base acknowledgment signal is transmitted. When an ACK key is operated, it will operate an associated lamp at all wing locations. When the last ACK key has been operated at a base, all ACK lamps at all wing locations will be extinguished. This will indicate that the base acknowledgment signal has been transmitted.

TRANSMISSION TESTS

3.03 The following tests are in addition to the normal circuit order tests for circuits of this type. They may also be used for trouble testing.

3.04 All tests in this part are to be made on an out-of-service basis.

3.05 Tests shall be made on the 4-wire line, on an over-all basis from each wing telephone set location to the first jack-equipped test point in the serving Central Office on both circuits to the base.

3.06 Reference is made to Section E37.250 where applicable.

3.07 Testing apparatus per Section E37.250, Part 5:

1 — Variable Frequency Oscillator

1 — Transmission Measuring Set

1 — Induction Coil
Other items listed, as required

3.08 Set up the test arrangement per Section E37.250.0, Chart 4, Fig. 7 at a wing location on the first 4-wire line. Adjust the oscillator to send 1000 cycles at plus 6.7 dbm.

3.09 At the serving Central Office measure at the first jack-equipped test point from the base. The measured value should be within 1.0 db of the value specified on the Circuit Layout Card.

3.10 Repeat Steps 3.08 and 3.09 using a test frequency of 2700 cycles. The measured value should be within 5 db of the value measured in Step 3.09.

3.11 Repeat Steps 3.08 and 3.09 using a test frequency of 2465 cycles. Vary the oscillator frequency slightly to obtain the maximum loss reading. The measured loss should exceed the value obtained in Step 3.09 by not less than 35 db. This is a test of the 202F Blocking Filter.

3.12 Transmit 1000 cycles from the serving test room to the base at the specified level at the test jack selected. The measured value at the wing location should be within 1.0 db of the value specified on the Circuit Layout Card.

3.13 Repeat Step 3.12 using a test frequency of 2700 cycles. The measured value should be within 5 db of the value measured in Step 3.12.

3.14 Repeat Step 3.12 using a test frequency of 2635 cycles. Vary the oscillator frequency slightly to obtain the maximum loss reading. The measured loss should exceed the value obtained in Step 3.12 by not less than 35 db. This is a test of the 202E Blocking Filter.

3.15 Repeat Steps 3.08, 3.09, and 3.13 at other frequencies specified under Circuit Order Tests, per Sections E26.040 and E26.041.

3.16 Repeat Steps 3.08 to 3.15, inclusive, on the second 4-wire line.

3.17 Repeat Steps 3.08 to 3.16, inclusive, at other wing locations served from the same base.

43A1 TELEGRAPH CARRIER CHANNEL

(A) General (SD-1G117-01, Fig. 1)

3.18 Arrange each 43A1 telegraph carrier channel unit as follows:

NETWORK		SWITCH POS		*EQUIP TUBE
SEND	REC	SEND	REC	SOCKETS
453L	454M	LM	L+	V1,V2,V3,V4,V5

* Verify that socket V6 is not equipped.

3.19 *Apparatus:*

1 — KS-14510 Volt-ohmmeter, or an equivalent voltmeter

3.20 The dc voltage across Terminals 5 and 8 on the 43A1 unit should be adjusted to 20 volts, plus or minus 0.5 volt, with normal supply voltage, by strapping resistors R34, R35, and R36, as required.

3.21 Adjust the LP CUR control to approximately the mid-position.

3.22 Adjust the REC GAIN control as described in Part (C) on page 9.

3.23 All other tests and adjustments, where applicable, except as covered in the following Part (B), should be in accordance with Sections E24.263.00 and E34.263.00 and associated point sections.

(B) 43A1 Transmitting Level

The following assumes that the transmission tests specified in Steps 3.03 to 3.17 have been made and the results are satisfactory.

3.24 The following test is to be made on an out-of-service basis.

3.25 At the base location on the circuit under test, block the LP relay in the operated position. This will result in the transmission of a steady mark signal.

3.26 At the Central Office, connect a transmission measuring set at the same test point as used in Step 3.09. The measured value should be within 0.2 db of the value specified on the Circuit Layout Card. To meet this requirement, adjust the SEND LEV potentiometer on the 43A1 panel at the base.

3.27 At the base, remove the block from the LP relay which was placed in Step 3.25.

(C) 43A1 Receiving Gain

If the 43A1 Receiving Unit is not to be operated at maximum gain (the REC GAIN potentiometer in the maximum clockwise position), proceed with the following:

These tests should be made as a part of circuit order tests or on a trouble basis as required. It is assumed that the receiving transmission levels are within the required transmission limits and slow pulses are being received.

3.28 Set the KS-14510 Volt-ohmmeter for a maximum reading of not less than 150V dc. Connect the negative terminal to Pin Jack G and the positive terminal to Pin Jack LP of the 43A1 Unit. Adjust the REC GAIN potentiometer in the clockwise direction, if necessary, until the voltmeter indicates that slow pulses are being received at the rate of one every 3 seconds. Between pulses the meter will indicate approximately 10 volts, or less. When a 100 MS slow pulse is received the meter will indicate its presence but will not indicate the maximum voltage of the pulse due to the short duration.

3.29 In the serving Central Office, adjust an attenuator for a loss equal to the specified maximum permissible line circuit level drop. This is the point at which the continuity failure alarm should operate at SAC or Headquarters. For example, if the specified level drops to produce a continuity failure alarm is 10 db, adjust the attenuator for a loss of 10 db.

3.30 After adjusting the attenuator per Step 3.29, connect it in series with the receive line from SAC or Headquarters at a convenient jack appearance.

3.31 At the base, verify that the slow pulses are being received as indicated by the voltmeter. If necessary, rotate the REC GAIN potentiometer in the clockwise direction until a pulse indication is observed.

3.32 While observing the slow pulse indications on the voltmeter, turn the REC GAIN potentiometer of the 43A1 Unit in the counterclockwise direction by a small increment at a time. Determine the potentiometer position at which the slow pulses just drop out (No Voltmeter Indication). Then, adjust the REC GAIN potentiometer, slowly by a small increment at a time, in the clockwise direction until slow pulses are again observed on the voltmeter. This is the final REC GAIN potentiometer setting.

FAST PULSE GENERATOR (SD-1G116-01, FIG. 2)

3.33 ***Apparatus:***

SD-96362-01 Pulse Checking Test Set
One 1W3A Cord or equivalent

3.34 ***Per Cent Break***

(1) Connect negative 48-volt battery and ground to the test set.

(2) With the lever-type key in the normal position, adjust the CAL rheostat to obtain a zero reading on the per cent break meter scale.

(3) Connect the spade-type tip of the 13WA cord to binding post P on the test set. Connect the 347A plug to the fast pulse generator TST jack. The reading should be between 49 and 51 per cent. Strap resistors R6 and R7, as required, to meet the requirement.

3.35 ***Pulse Speed***

(1) Adjust the CAL rheostat per Step 3.34(2).

(2) Operate the SCALE key to the 20 position.

(3) Operate the lever-type key to the PPS position and observe the 0-20 pulses per second scale. The reading should be between 4.8 and 5.2 per second. Strap Resistors R2, R3, and R4, as described on the drawing, as required, to obtain the required reading.

3.36 Recheck Step 3.34 if a change of resistor strapping is made in Step 3.35.

FAST PULSE RECEIVER (SD-1G116-01, FIG. 6)

3.37 The fast pulse receiver is adjusted to operate on the fifth fast pulse received. A test circuit is provided as a part of the base equipment.

3.38 ***Apparatus:***

One Test Cord equipped with a 347A Plug, or, one 165C Open Plug.

3.39 Hold the nonlocking B TST key operated and insert the open plug in the fast pulse generator A TST jack. To prevent false operation of equipment at wing locations, the B TST key must be held operated until after the A relay

releases at the end of each test cycle. Observe the A relay and determine the number of pulses required to operate it. This can be determined by listening to the operation of the pulsing P2 relay and counting the pulses. Remove the open plug from the TST jack to stop the test cycle. Adjust the P potentiometer, as required, to obtain operation of relay A on the fifth pulse. Failure to meet this requirement may be due to a defective cold cathode tube V3.

3.40 Repeat a test cycle per Step 3.39, except remove the open plug from the generator TST jack immediately after the A relay operates. The relay should remain operated for approximately 2 seconds. Failure to do so may be due to a defective cold cathode tube in the V4 tube socket.

TRANSMISSION OF FAST AND LONG PULSE SIGNALS

3.41 The following tests must be made on an out-of-service basis with the base 4-wire line terminated at the serving Central Office.

3.42 Momentarily connect a ground to the H relay, released Contact 4. The H relay should operate in approximately 2 seconds to end the transmission of a fast pulse acknowledgment signal. The H relay should remain operated for approximately 1.5 seconds.

3.43 Momentarily connect a ground to the H relay, released Contact 6. The H relay should operate in approximately 1.5 seconds to end the transmission of the long pulse line signal.

3.44 If the H relay fails to operate within the approximate time intervals specified in Steps 3.42 and 3.43, try replacing the cold cathode tube in socket V5.

SLOW PULSE REPEATER

3.45 Make tube tests and replacements on the same basis as specified for the associated 43A1 telegraph carrier terminal in Section E24.263.1.