

## GROUP ALERTING SYSTEM

### TRANSMISSION TESTING METHODS AND REQUIREMENTS

CONTENTS	PAGE
1. GENERAL . . . . .	1
A. Test Procedures and Requirements . . . . .	1
B. Preparation . . . . .	2
2. CONTROL STATION LOOPS . . . . .	2
3. LOCAL CENTRAL OFFICE . . . . .	3
4. INTEROFFICE TRUNKS . . . . .	4
5. SECOND CENTRAL OFFICE . . . . .	5
6. ALERT WARNING TONE . . . . .	6

#### 1. GENERAL

**1.01** This section describes the transmission testing methods and requirements for the Group Alerting System.

**1.02** The Group Alerting System is intended for use in local dial offices and provides facilities for alerting one or more groups of subscribers simultaneously.

**1.03** The basic system provides for a control station from which oral announcements are made from a 500-type telephone set. A separate monitor telephone set may be optionally supplied at the control station and connected to the alerting network at the local central office. One or two alternate control stations may also be provided.

**1.04** An expanded alerting system provides for automatic repetition of the alerting announcement from an announcement set throughout the predetermined alert period. A key telephone set and control unit are provided with this arrangement to provide necessary controls and indicators.

**1.05** The following references provide information supplementary to this section.

- 480-310-100 — Group Alerting System, Identification
- 480-310-200 — Group Alerting System, Station Apparatus, Installation and Maintenance
- 480-310-400 — Group Alerting System, Station Apparatus, Connections
- A204.595 — Group Alerting System, J95421
- AB22.333 — Group Alerting System, Transmission Design Considerations

**1.06** The following test equipment is required at the local central office and at the second central office when applicable. An equivalent oscillator and TMS are required for tests at control stations.

- 23A Transmission Measuring Set (TMS) or equivalent
- KS-19353 Oscillator, or 5A Attenuator with 1-mw (1000-cps) Supply
- Appropriate Testing and Patching Cords

#### A. Test Procedures and Requirements

**1.07** A systemwide alignment can be achieved only when tests and adjustments of the control station loops, the local central office equipment, and the second central office equipment are made in that order. Transmission measurements on interoffice trunks may be made in advance to establish their suitability to serve the required lines or to determine whether amplification will be required. Record trunk identification and measurement data for future reference.

**1.08** Tests on control station loops should be made on service order and during trouble investigations. Tests on amplifiers and interoffice facilities should be made on service order, during trouble investigations, and at 6-month intervals.

**B. Preparation**

**1.09** Provide personnel and test equipment simultaneously at the local central office and at the appropriate control station during control loop tests. Communications between the sites will be required. A TMS and an oscillator will be required at the control station. A TMS and an oscillator (or 1000-cps 1-mw supply with attenuator) will be required at the local central office.

**1.10** Provide an oscillator (or 1000-cps 1-mw supply with attenuator) and a TMS at the local central office for adjustment of equipment at this office.

**1.11** Provide personnel and test equipment simultaneously at the local central office and at the second central office for measurements on interoffice trunks and for adjustments of office equipment at the second office. Provide equipment listed in 1.10 at the local office. Provide a TMS at the second office. Communications will be required between the sites.

**1.12** Test equipment should be calibrated before beginning tests. All TMS measurements are made on 600-ohm termination.



*It is extremely important that this system provide reliable and uninterrupted service at all times. The circuit should never be taken out of service without the express permission of the customer.*

**2. CONTROL STATION LOOPS**

**2.01** Control station loops meet the requirements of standard subscriber loop design. The external loop resistance must not exceed 1300 ohms.

**2.02** Each control station may have an alternate control loop in addition to the regular control loop. As many as three control stations (including two alternates) may be provided. Each regular and alternate loop to the primary and each alternate control station is tested and adjusted according to the procedure described below.

STEP	PROCEDURE
	<p><b>Measurement and Adjustment of Control Loop Loss</b></p> <p><i>Note:</i> This test applies to control and alternate control loops to each control and alternate control station.</p> <p>1 At local central office (LCO) operate AUD RLS key.</p> <p>2 At LCO operate SEL key to the OFF position to disable the selecting and timing circuits.</p> <p>3 At LCO manually operate the D relay associated with the control loop under test. The D relay will lock in its operated position removing dial tone from control loop.</p> <p>4 At LCO insert dummy plugs into AMP 1 IN jack and AMP 2 IN jack.</p> <p>5 At LCO connect a 600-ohm TMS across output terminals 3 and 4 of 1C pad associated with control loop under test.</p> <p>6 At control station (CS) adjust output of oscillator to 1000 cycles at -9 dbm as measured on 600-ohm TMS. Disconnect TMS and apply oscillator output across T and R leads of control loop under test. Station set must be on-hook. (See Fig. 1A.)</p>

STEP	PROCEDURE
7	At LCO read tone level received on TMS. On previously aligned system, level should be $-19 \text{ dbm} \pm 0.5 \text{ db}$ . For initial alignment adjust 1C pad so that loop loss plus pad loss is equal to 10 db. The received tone level will then be $-19 \text{ dbm} \pm 0.25 \text{ db}$ . Use 89-type resistors. (See Fig. 2.)
8	Remove TMS connection and remove dummy plugs from AMP 1 IN jack and AMP 2 IN jack.
9	When the 1C pad in each control or alternate control loop has been adjusted as described in Steps 1 through 7, disconnect and remove test equipment at control station(s).
10	At LCO, restore D relay to normal position.
11	If adjustments to local central office equipment are to be made, continue with the applicable test procedure. If no further tests are to be made at LCO, restore SEL key to ON position and release AUD RLS key.

### 3. LOCAL CENTRAL OFFICE

**3.01** During a systemwide alignment, adjustments to central office circuits will be made in continuation to control loop tests previously described. At other times, tests may originate at the local central office as described in the procedure below.

**3.02** Observe that bus bar levels, as read on the TMS connected to the LOAD jack, are shown in dbm but are actually db levels. Although measurements are made with a standard 600-ohm db meter, the levels are not referred to 1 mw because of the low impedance of the bus bar.

**3.03** The following test procedure is applicable to offices with amplifiers arranged for combined (parallel) inputs. (See Fig. 1A.)

STEP	PROCEDURE
	<b>Local Central Office Tests (Fig. 1A)</b>
1	Operate AUD RLS key; operate SEL switch to OFF position.
2	Adjust output of oscillator (on other signal source) to 1000 cycles at $-19 \text{ dbm}$ , as measured on 600-ohm TMS, and connect oscillator to AMP 1 IN jack.
3	Insert dummy plug into AMP 2 OUT jack.
4	Connect TMS to LOAD jack.
5	Adjust GAIN potentiometer of AMP 1 to obtain reading of $-11 \text{ db}$ on TMS.
6	Remove dummy plug from AMP 2 OUT jack and insert into AMP 1 OUT jack.
7	Adjust GAIN potentiometer of AMP 2 to obtain reading of $-11 \text{ db}$ on TMS.

STEP	PROCEDURE
8	Remove dummy plug from AMP 1 OUT jack. Reading on TMS should now be approximately -8 db. A substantially lower reading indicates that the amplifiers are not properly connected for additive output.
9	If tests on interoffice trunks are to be made, continue test tone input and proceed with the applicable tests.
10	If no further tests are to be made, remove test equipment connections; restore SEL switch to ON position; release AUD RLS key.
11	Report the system back in service.

#### 4. INTEROFFICE TRUNKS

**4.01** Interoffice trunk transmission losses determine the number of subscribers that can be served from the distant central office without providing amplification at that office. Refer through lines of supervision if the limits listed are exceeded when amplification is not provided.

#### INTEROFFICE TRUNK LOSS IN DB

0

2

4

6

#### MAXIMUM NUMBER OF SUBSCRIBERS SERVED FROM SECOND OFFICE

23

16

11

7

STEP	PROCEDURE
	<p><b>Interoffice Trunk Losses</b></p> <p>1 Transmission loss measurements on interoffice trunks are made with 1000-cycle test tone applied at AMP 1 IN jack and adjusted to read -8 db on a 600-ohm TMS connected to the LOAD jack in the LCO. Refer to test procedures for local central offices.</p> <p>2 At second central office connect 600-ohm TMS to TST jack of trunk to be tested and measure received test tone level.</p> <p>3 Record measured losses for comparison with those obtained in subsequent interoffice trunk tests.</p> <p>4 If amplification is provided at the second central office and adjustments are to be made, continue as described in test procedures for second central offices.</p> <p>5 If no further tests are to be made, disconnect test equipment at each central office and restore system to service.</p>

**5. SECOND CENTRAL OFFICE**

**5.01** A second central office, if connected to the alerting system, will require amplification if interoffice trunk loss and/or number of subscribers to be served exceed(s) the limits stated in 4.01.

**5.02** Amplifier arrangements in the second central office are similar to those in the local central office. If one interoffice trunk is provided, the arrangement is similar to that at the LCO. If two interoffice trunks are provided, the circuits

are connected in parallel only at the outputs of the amplifiers. (See Fig. 1C and 1D.)

**5.03** Adjustments to amplifier gain at the second central office are made with 1000-cycle tone applied to the LCO AMP 1 IN jack and adjusted to read -8 db on a 600-ohm TMS connected to the LOAD jack in the LCO.

**5.04** The following test procedure is applicable to second central offices providing amplifiers. (See Fig. 1C.)

STEP	PROCEDURE
<p><b>Second Central Office Tests (Fig. 1C)</b></p> <p><i>Note:</i> The following procedure is accomplished after completion of adjustments to local central office equipment and is a continuation of that procedure.</p>	
1	Test tone is received over an interoffice trunk from the local central office.
2	Insert dummy plug into AMP 2 OUT jack.
3	Connect 600-ohm TMS to LOAD jack.
4	Adjust GAIN potentiometer of AMP 1 to obtain a reading of -11 dbm on TMS.
5	Remove dummy plug from AMP 2 OUT jack and insert into AMP 1 OUT jack.
6	Adjust GAIN potentiometer of AMP 2 to obtain a reading of -11 dbm on TMS.
7	Remove dummy plug from AMP 1 OUT jack. Reading on TMS should now be approximately -8 dbm. A substantially lower reading indicates that amplifiers are not properly connected for additive output.
8	Remove TMS and test tone connections. At local central office, restore SEL switch to ON position and release AUD RLS switch. Return system to service.

**5.05** The following test procedure is applicable to second central offices having separate

inputs to amplifiers from two interoffice trunks. (See Fig. 1D.)

STEP	PROCEDURE
<p><b>Second Central Office Tests (Fig. 1D)</b></p> <p><i>Note:</i> The following procedure is accomplished after completion of adjustments to local central office equipment and is a continuation of that procedure.</p>	
1	Transmission loss measurement on interoffice trunks are made with 1000-cycle tone applied at AMP 1 IN jack and adjusted to read -8 db on a 600-ohm TMS connected to the LOAD jack in the LCO. Refer to test procedures for local offices.

STEP	PROCEDURE
2	Insert dummy plug into AMP 2 OUT jack.
3	Connect 600-ohm TMS to LOAD jack.
4	Adjust GAIN potentiometer of AMP 1 to obtain reading of -11 dbm on TMS.
5	Remove dummy plug from AMP 2 OUT jack and insert into AMP 1 OUT jack.
6	Adjust GAIN potentiometer of AMP 2 to obtain reading of -11 dbm on TMS.
7	Remove dummy plug from AMP 1 OUT jack. Reading on TMS should now be approximately -8 db. A substantially lower reading indicates that the amplifiers are not properly connected for additive output.
8	Remove TMS and test tone connections. At local central office, restore SEL switch to ON position and release AUD RLS switch. Return system to service.

#### 6. ALERT WARNING TONE

6.01 When alert warning tone is provided, the tone level should be measured at the tone bus and adjusted, if required. Adjust the GAIN

potentiometer of the tone amplifier to produce an output of 15.5 volts, as measured at the bus with no load connected. (See Fig. 1E.)

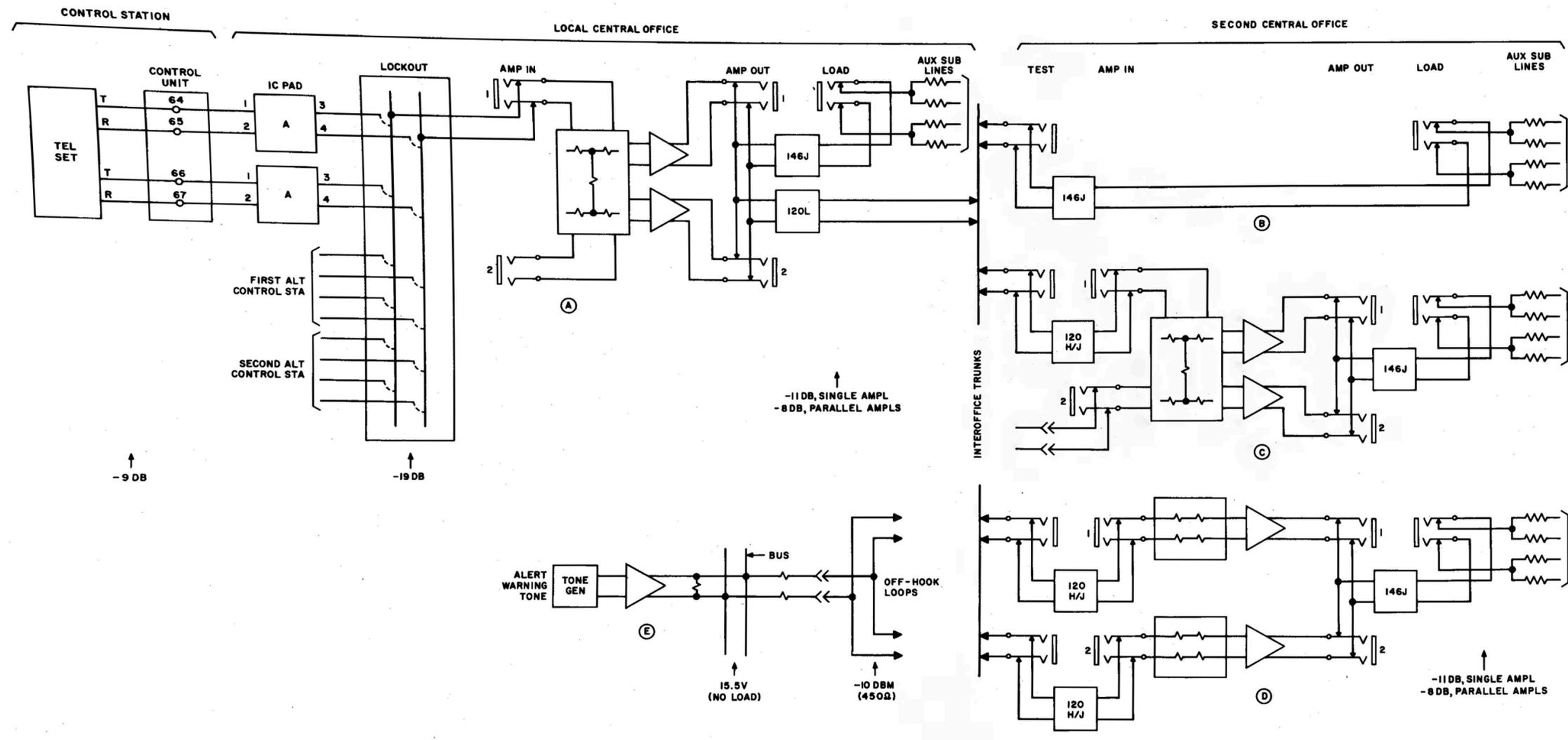


Fig. 1— Typical Group Alerting System, Block Diagram Showing Optional Features and Interoffice Arrangements with Transmission Levels

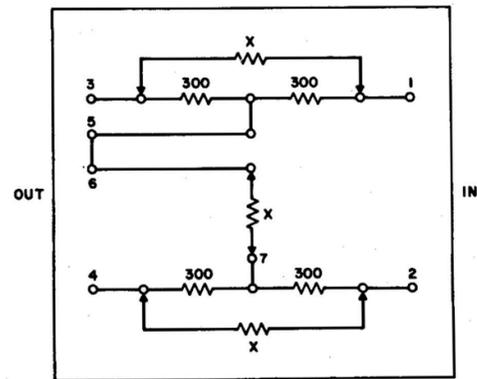


Fig. 2— A (IC) Pad