

PERFORMANCE REQUIREMENTS
NO. 3A ANNOUNCEMENT SYSTEM
GENERAL EQUIPMENT REQUIREMENTS
COMMON SYSTEMS

1. GENERAL

1.01 This section covers the performance requirements for the No. 3A announcement system.

1.02 This section is reissued to incorporate material from the addendum in its proper location. In this process, marginal arrows have been omitted.

1.03 Reference shall be made to Section 800-630-180 covering general performance requirements for additional information necessary for the proper application of the requirements listed herein. However, the transmission requirements specified herein shall be met at the time of turnover whether or not requested by the customer.

1.04 The amplifiers contain coils which may be permanently damaged through magnetization if direct current is passed through their windings.

1.05 The electrical equivalent of the transmission measuring sets specified will be satisfactory for the transmission measurements specified in this section.

2. CIRCUIT OPERATION TESTS

A. Routine and Supplementary Test Requirements

2.01 *Control (Announcement Bureau), Volume Limit Indicator, and Tape Amplifier Circuits*

- (a) This equipment shall test clear of trouble over the last 100 calls.
- (b) The equipment shall test clear of trouble when on selecting, erasing and recording,

the load is transferred 5 times from one machine to the next using all three machines.

2.02 The routine and supplementary tests of the announcement bureau are based on a service adjustment of the No. 109B amplifier which provides an output of +2 VU on the volume indicator meter with a recording on the tape of 1000 cycles down 24 db with respect to 1 milliwatt.

2.03 *Control (Subcenter) Circuits:* This equipment shall test clear of trouble over the last 100 calls.

2.04 *Trunk and Distributing Circuits*

- (a) Tests involving a minimum of 5 calls shall be made over each announcement trunk circuit.
- (b) This equipment shall test clear of trouble over the last 5 calls.

B. Description of Routine and Supplementary Tests

Control (Announcement Bureau), Volume Limit Indicator and Tape Amplifier Circuits

2.05 *Routine Test:* A routine test shall consist of calls completed to the announcement desk and distributed approximately evenly over the three machines.

2.06 *Supplementary Tests:* Check all the functions of the circuit not covered under the routine tests including the following:

- (a) Make busy features checked from the turret and control unit.
- (b) Single cut-in of the machines.
- (c) Automatic and manual transfer of the

SECTION 801-603-181

load from one machine to a spare machine due to failure of the first machine.

- (d) Cut-off of machine announcements and introduction of manual announcements.
- (e) Recording during emergency manual announcements.
- (f) Supervision and trouble signals.
- (g) Minor and major alarm features.
- (h) Volume control features.
- (i) Proper high and low volume indications from the volume limit indicator.
- (j) Check of the erase and record features of each machine from the respective erase and record keys at the control unit.
- (k) Disconnect of the associated tape amplifier from the control circuit when the plug is inserted into the associated IN jack.
- (l) Test of the start of the tape machine when the monitoring plug is inserted into the associated monitoring jack.
- (m) Monitoring from the load monitoring jack.
- (n) Patching each control circuit power amplifier one at a time to the load by means of the load jacks.

Control Circuit (Subcenter)

2.07 Routine Test: A routine test shall consist of the proper origination and completion of calls.

2.08 Supplementary Tests: Check all the functions of the circuit not covered under the routine tests including the following:

- (a) Removal of one channel from service due to a trouble condition on the associated trunk from the announcement bureau. This check should be made on each channel.
- (b) Removal of both channels from service

due to trouble condition on the associated trunks from the announcement bureau.

- (c) Major and minor alarm conditions.
- (d) Test of continuity of load to the volume level indicator.
- (e) Check of timing features.
- (f) Satisfactory volume when both amplifiers are connected to the output.

Trunk and Distributing Circuits

2.09 Routine Test: A routine test shall consist of the proper origination and completion of calls including a check of all charging, holding, busy, timeout, disconnect, ringing and digit absorbing features.

2.10 Supplementary Tests: Check all the functions of the circuit not covered under routine tests including the following:

- (a) Miscellaneous register features.
- (b) Manual transfer from one distributing circuit to another.

Miscellaneous Supplementary Tests

2.11 Erasing Coil: The current through the erase coil with the ERASE key operated shall be checked for proper polarity and shall be min. .045 amp., max. .055 amp. measured at the terminal strip of the tape recorder. This shall be checked on each tape announcing machine.

2.12 Voice Calls: With the R1 potentiometer turned 1/4 of a turn back from the extreme clockwise position the current through the voice coil with the RECORD key operated shall be checked for proper polarity and shall be min. .0045 amp., max. .0055 amp. measured at the terminal strip of the tape recorder. This shall be checked on each tape announcing machine.

2.13 Volume Limit Indicator: The filament current measured at the jack F with the ST key operated to the ON position shall be min. .490 amp., max. .530 amp.

3. TRANSMISSION TEST REQUIREMENTS FOR ANNOUNCEMENT BUREAU CIRCUITS

Announcement Bureau

3.01 The output at the 1000 cycle jack on the control unit shall be 1 milliwatt \pm .2 db. Use the No. 7A Transmission Measuring Set.

Note: After this measurement has been checked this jack may be used as a reference to check the calibration of the No. 13A transmission measuring set.

The output at the 1000 cycle -24 db jack on the control unit shall be a loss of 24 ± 0.5 db with respect to 1 milliwatt. Use the No. 13A transmission measuring set.

3.02 Each No. 109B Amplifier shall be tested at max. gain setting to meet the following requirements:

(a) *Noise:* With the input to the amplifier short circuited the output noise shall be down more than 35 db with respect to 1 milliwatt. Use the No. 13A transmission measuring set connected to the associated OUT jack of the control unit.

(b) *Gain:* With an input of 1000 cycle down 40 db with respect to 1 milliwatt connected at the associated IN jack of the control circuit, the output shall be a gain of 5 ± 2 db with respect to 1 milliwatt. With an input of 100 cycle and 5000 cycle down 40 db the gain shall not differ from the 1000 cycle gain by more than ± 2 db. Use the No. 13A transmission measuring set connected to the associated OUT jack of the control unit.

3.03 Each Tape Recorder and Tape Amplifier shall meet the following requirement:

(a) *Noise:* With no recording on the tape (ERASE key previously operated long enough for all the tape to pass by the erase coil) the output of the tape amplifier (ERASE RECORD key normal) shall be a loss of 30 ± 2 db with respect to 1 milliwatt. The R1 potentiometer shall be adjusted to meet these requirements. Any momentary kicks of the transmission measuring set meter needle may be

disregarded. Use the No. 13A transmission measuring set connected at the J1 jack on the tape amplifier panel.

(b) *Gain:* With a recording on the tape of 1000 cycle down 24 db with respect to 1 milliwatt (1 milliwatt from a 1000 cycle oscillator connected thru a 24 db pad to the TEST RECORD jack and the RECORD key operated 15-20 seconds) the output of the tape amplifier (ERASE-RECORD key normal) shall be a gain of 1 db with respect to 1 milliwatt. The R2 potentiometer shall be adjusted and the recording and measuring repeated until the requirement is met. The previous recording shall be erased (ERASE key operated) prior to each recording. The R1 potentiometer adjustment for noise shall not be changed. Use the No. 13A transmission measuring set connected at the J1 jack on the tape amplifier panel.

(c) With the output of the tape amplifier measured on the volume indicator (the transmission measuring set connected to the J1 jack as above and the REC AMP key on the control unit operated) the meter shall read -3 ± 1 vu.

(d) With recordings on the tape of 200 cycle down 24 db with respect to 1 milliwatt and 4000 cycle down 24 db with respect to 1 milliwatt the gain of the tape amplifier shall not differ from the 1000 cycle gain above by a loss greater than 8 db. Use the No. 13A transmission measuring set connected at the J1 jack on the tape amplifier panel.

3.04 Each Tape Recorder, Tape Amplifier and Associated 109B Amplifier of the control circuit shall meet the following requirements:

(a) *Gain:* With a recording on the tape of 1000 cycle down 24 db with respect to 1 milliwatt the output of the 109B amplifier shall be a gain of 9 db with respect to 1 milliwatt. The potentiometer on the 109B amplifier panel shall be adjusted to meet this requirement. Use the No. 13A transmission measuring set connected to the associated OUT jack of the control unit.

(b) With the output of the 109B amplifier measured on the volume indicator (the

transmission measuring set connected to the OUT jack as above and the associated PWR key of the control unit operated) the meter shall read -3 ± 1 vu.

Volume Limit Indicator Circuit

3.05 With a 1000 cycle 1 milliwatt input to the TST jack on volume limit indicator panel and the L key and the TST key on the panel operated, the A potentiometer shall be adjusted so that the L lamp is extinguished when the potentiometer is turned in a counterclockwise direction. The release and reoperation of the TST key and the operation of the H key shall cause the H lamp to flash. If necessary the adjustment of the A potentiometer may be changed slightly to meet this requirement.

3.06 The operation of the volume limit indicator shall be checked as follows: With the gain of the tape recorder, tape amplifier and associated No. 109B amplifier measured on the volume indicator as in 3.04 above, the output of the No. 109B amplifier connected thru the control circuit to trunk circuit in the normal manner, the potentiometer on the No. 109B amplifier shall be adjusted until the volume indicator reads -7 vu in which case the volume limit indicator shall remove the transmission pad from the control circuit as indicated by the operation of the PS relay. With the potentiometer on the No. 109B amplifier adjusted until the volume indicator reads -15 vu the volume limit indicator shall bring in a minor alarm and transfer the speech channel.

Trunk Circuits

3.07 The trunk circuits shall meet either the requirements specified below or the transmission requirements specified on the circuit drawings. The tests specified below do not require the removal of soldered connections to test each trunk circuit.

(a) With the gain of the tape recorder, tape amplifier and associated No. 109B amplifier measured on the transmission measuring set as in paragraph 3.04 above, the potentiometer on the No. 109B amplifier panel shall be adjusted to measure a gain of 9 db on the transmission measuring set and, for use in

tests below, a notation shall be kept of the output of the No. 109B amplifier as read on the volume indicator.

(b) The output of the No. 109B amplifier at the OUT jack of the control unit shall be connected to the common input to all the trunk circuits. The output of the trunk circuit under test shall be terminated by the No. 13A transmission measuring set and the output of all other trunk circuits shall not be terminated.

(c) The gain of the No. 109B amplifier shall be readjusted, if required, so that the reading of the volume indicator is the same as the reading in (a) above.

(d) The output of each trunk circuit as measured on the No. 13A transmission measuring set shall meet the following requirements:

VALUE OF A RESISTANCE IN OHMS	OUTPUT IN DB BELOW 1 MILLIWATT
1000	1.4 ± 0.4
1500	3.6 ± 0.4
2000	5.4 ± 0.4
2500	6.9 ± 0.4
3000	8.1 ± 0.4
3500	9.2 ± 0.4
4000	10.2 ± 0.4
4500	11.1 ± 0.4
5000	11.8 ± 0.4

Subcenter

3.08 Each 109B Amplifier shall be tested to meet the following requirements:

(a) **Noise:** With the input to the amplifier short circuited, the output at maximum gain setting shall be down more than 35 db with respect to 1 milliwatt. Use the No. 13A transmission measuring set connected to the associated OUT jack of the control unit.

(b) **Gain:** With an input of 1000 cycle down 40 db with respect to 1 milliwatt connected to the associated IN jack of the control unit the output at maximum gain setting shall be a gain of 4 ± 2.5 db with respect to 1 milliwatt. This measurement includes two 120C repeat coils. However, the 23A equalizer shall be re-

moved by unsoldering the leads to terminals 1 and 2. Use the No. 13A transmission measuring set connected to the associated OUT jack of the control unit.

(c) With an input of 1000 cycles down 24 db with respect to 1 milliwatt connected to the associated IN jack of the control unit the gain shall be adjusted to 9 db with respect to 1 milliwatt. Use the No. 13A transmission measuring set connected to the associated OUT jack of the control unit. With the output of the amplifier measured on the volume indicator (the associated AMP key of the control circuit operated) the meter shall read -3 ± 1 vu.

3.09 Sensitrol Relays: With a 600 ohm termination across the a-c line terminals of the external rectifier associated with the sensitrol relay and all other connections removed from these terminals, the relay shall make contact on an input of 1 milliwatt ± 0.5 db at 1,000 cycles. The movable red index on the relay shall be adjusted to meet these requirements. The relay shall release every six minutes.

Trunk Circuits

3.10 The trunk circuits shall meet either the requirements specified below or the transmission requirements specified on the circuit drawings.

(a) With an input of 1000 cycles down 24 db and the gain adjusted to +9 db as in paragraph 3.08 above, a notation shall be kept of the output of the 109B amplifier as read on the volume indicator.

(b) The output of the 109B amplifier at the OUT jack of the control unit shall be connected to the common input to all the trunk circuits. The output of the trunk circuit under test shall be terminated by the 13A transmission measuring set and the output of all other trunk circuits shall not be terminated.

(c) The gain of the 109B amplifier shall be re-adjusted, if required, so that the reading of the volume indicator is the same as the reading in paragraph (a) above.

(d) The output of each trunk circuit as measured on a 13A transmission measuring set shall meet the following requirements:

VALUE OF A RESISTANCE IN OHMS	OUTPUT IN DB BELOW 1 MILLIWATT
1000	1.4 \pm 0.4
1500	3.6 \pm 0.4
2000	5.4 \pm 0.4
2500	6.9 \pm 0.4
3000	8.1 \pm 0.4
3500	9.2 \pm 0.4
4000	10.2 \pm 0.4
4500	11.1 \pm 0.4
5000	11.8 \pm 0.4

4. TEST REPORTS AND RECORDS

4.01 In addition to the reports and records specified in Section 800-630-180, the results of all gain tests shall be recorded on a suitable data form and shall be turned over to the local representative of the Telephone Company in the office where the equipment is installed.

Bell Telephone Laboratories, Inc.