

## 306 SWITCHING SYSTEM LINE-UP AND OVERALL TESTS

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### 1. GENERAL

**1.01** This section provides test procedures for use in verifying operation of the 306 switching system. Refer to Section 981-208-100 for complete system descriptive information.

**1.02** This section is reissued to incorporate the various additions and changes made to permit the 306 switching system direct access to AUTOVON.

**1.03** The test procedures are designed to be performed while the system is in operation. Before performing these tests, the necessary service releases must be obtained since amplifier line-up tests will interrupt service. The system tests provide a check of amplifier gain and transmis-

sion quality and a means of exercising system switching capabilities.

**1.04** The system tests described in Part 2 and listed in Table 1 and Tests A through I (Part 4) provide a complete system operational check when performed in sequence. However, each test is independent of all other tests (except where noted) and may be performed as a separate and complete operational test if desired.

**1.05** The tests contained in Table 1 are amplifier gain tests. These tests must be performed near the amplifiers wherever located in the system via the jacks provided. The remaining tests, Tests A through I, are system operational tests which are performed at the console. Section 480-713-301, Console — Method of Operation, is an integral part of Tests A through I.

### 2. AMPLIFIER LINE-UP

**2.01** The following test equipment, or the equivalent, is required to perform system line-up.

1 — J94021A Transmission Measuring Set (21A TMS)

2 — P2B Patch Cords Equipped with Two 310 Plugs

**2.02** The input levels, gain requirements, and designations for the amplifiers in the 306 switching system are given in Table 1. Adjust the gain of each amplifier in accordance with the following typical test procedure.

(1) Set the 21A TMS oscillator for 1000 cycles and adjust the output to match the input transmission level value designated in Table 1 for the amplifier under test.

(2) Patch one of the OSC OUT 600  $\Omega$  jacks on the 21A TMS to the AMP IN jack of the amplifier under test. Use the P2B patch cord.

<b>TABLE 1</b>		
AMPLIFIER DESIGNATION	INPUT LEVEL (TLP)	GAIN SETTING (DB)
<b>Line and Position Switching Circuit Unit J1G017A</b>		
R	+1	22
T	-40	30.6
S	-16	23
<b>Central Office Trunk Circuit Unit For Direct Distance Dialing Network J1G017F</b>		
R	-4	11
T	-16	20
<b>Trunk Circuit Unit With Preemption Feature J1G017D</b>		
R	*	**
T	-16	**
<b>Speaker Line Circuit Unit J1G017M</b>		
R	0	**
<b>Residence Line Circuit Unit With SF Signaling J1G017J</b>		
R	-16	**
T	*	**
<p>*Input varies in accordance with level supplied by connecting circuit.</p> <p>**Gain must be adjusted to meet level requirements of connecting circuit.</p>		

(3) Patch one of the DET IN 600  $\Omega$  jacks on the 21A TMS to the AMP OUT jack of the amplifier under test. Use the P2B patch cord.

(4) Adjust the gain of the amplifier to approximate the value given in Table 1.

(5) When the adjustment is complete, remove the patch cords, proceed to the next amplifier, and repeat Steps (1) through (4).

### 3. SYSTEM TESTS

#### A. General

**3.01** A complete system line-up and overall operational check may be performed using Part 2, Amplifier Line-Up (including Table 1), and Part 4, Tests A through I. If it is desired to use only part of the operational tests provided, refer to the appropriate test in Part 4 and perform the tests as directed.

**B. Overall Operational Tests**

**3.02** Overall operational tests may be performed by referring to Tests A through I and the associated Section 480-713-301 for console operating methods. Tests A through I provide tests of the 306 switching system by operating function. Tests for the major functions of the system are contained in Tests A, B, E, and F. Certain subordinate functions logically associated with the major functions are included in these tests at the appropriate point. The minor functions of the system are described in Tests C, D, G, H, and I. The minor functions are also associated with the major functions but are performed as separate tests. Tests A through I are as follows:

- A — Trunk Calls and Recorders 1 and 2
- B — Local Line Calls, Local Recall, Audible Cutoff, Local Loudspeaker, Console Loudspeaker, and Line Release
- C — Recorders 3 and 4 and Console Loudspeaker
- D — Multiple Key Operation
- E — Line Transfer
- F — Conferencing and Trunk Recall

- G — Noncolor Conference Identification
- H — Position Lock
- I — Local and Remote Control Option

**3.03** A complete system operational check may be performed at the system console by performing Tests A through I in sequence. Section 480-713-301 describes the key operations and visual and audible indications associated with system functions. When these functions are required as a part of Tests A through I (i.e., outgoing and incoming trunk calls and line calls, line transfer, etc.), the console operating information required will be found listed by function in Section 480-713-301.

**3.04** Any of Tests A through I may be performed independently of the other tests if desired, except when otherwise instructed in the selected test.

**3.05** Before beginning any of the Tests A through I, all trunks, lines, and the attendant position should be released and all lamps should be extinguished except the local control (LOCAL CONT) key lamp unless otherwise stated in the selected test.

**4. METHOD**

STEP	ACTION	VERIFICATION
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**A. Trunk Calls and Recorders 1 and 2**

**JCSAN Trunks and Recorders 1 and 2**

1	Place an outgoing call and request an incoming call on each JCSAN trunk, first to NMCC and then to WASH PBX. The JCSAN trunk must be released by the attendant and by distant end disconnect at the completion of each outgoing and incoming call. Conversation with the controller at the distant end during each call will determine if transmission is normal and will provide sound for the associated recorder, which starts automatically when the trunk is selected.	Ascertain that all visual and audible signals are present, that associated recorder tape index register lamp is lighted, and that tape index register is in motion when a JCSAN trunk is connected. Index register in-use lamp should extinguish and register should stop when JCSAN trunk is disconnected. When JCSAN trunk is released and attendant releases his position, all supervisory lamps are extinguished.
2	Play back the recordings made by recorders 1 and 2 on the JCSAN trunks in Step 1.	Observe that the various recorder control key supervisory lamp signals are present and that playback quality and console speaker performance are normal. Also observe that tape index register and in-use lamp operate normally.

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<b>STEP</b>	<b>ACTION</b>	<b>VERIFICATION</b>
3	Check the 117-minute early-warning alarm and the 120-minute end-of-tape alarm for recorders 1 and 2 by operating the REC F. FWD key until tape index register indicates the equivalent of 117-minute and 120-minute elapsed times, respectively. Operate audible cutoff (AUD CO) key to retire buzzer alarm. Rewind recorders.	Ascertain that the visual and audible signals are present at the 117-minute and the 120-minute points on the tape. The audible signal (buzzer) should be cut off when the AUD CO key is operated.

**Direct Trunks**

4	Place an outgoing call and request an incoming call on each direct trunk. The direct trunk must be released by the attendant and by distant end disconnect at the completion of each outgoing and incoming call before going on to the next call. Conversation with the attendant at the distant end during each call will determine if transmission is normal.	Observe that all visual and audible signals are present and that transmission quality is normal during conversation with the distant end. The trunk key lamp will not extinguish until the distant end of the direct trunk disconnects.
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**AUTOVON Trunks**

5	Repeat Step 4 for AUTOVON trunks. Upon completion of each call, the AUTOVON trunks must be released by the attendant and by distant end disconnect.	Observe that all visual and audible signals are present and that normal transmission is evident during conversation with the distant end. The trunk key lamp will not extinguish until the distant end disconnects.
↗ 6	Place an outgoing call on AUTOVON trunk and request a priority incoming call. Maintain the AUTOVON trunk busy so that the incoming priority call will cause the switching center to apply preemption signals to the AUTOVON trunk circuit.	Observe that preemption signal causes trunk lamp to flash and steady ringing to occur.
7	Release AUTOVON trunk and await incoming priority call.	Observe that priority ringing occurs and that trunk lamp flashes.
8	Answer priority call in normal manner. Conversation with attendant at distant end will determine if transmission is normal. AUTOVON trunks must be released by the attendant and by distant end disconnect.	The trunk key lamp will not be extinguished until distant end disconnects.

**Direct Distance Dialing (DDD) Trunks**

9	Place an outgoing call and request an incoming call on the DDD trunk. DDD trunk release after completion of each call is initiated by hang-up or by operation of the attendant release (ATT RLS) key.	Observe that all visual and audible signals are present and that normal transmission is evident during conversation with the distant end. When each trunk test is completed and the trunk is released, the associated trunk lamp signals are extinguished and the attendant telephone is disconnected from the bridge.
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STEP	ACTION	VERIFICATION
<b>B. Local Line Calls, Local Recall, Audible Cutoff, Local Loudspeaker, Console Loudspeaker, and Line Release</b>		
1	Steps 1 and 2 of Test C may be performed at this point if it is desired to test recorders 3 and 4 and to test connection of recorder 3 or 4 to the console loudspeaker.	See Test C, Steps 1 and 2.
2	Place an outgoing call and request an incoming call on each dc, SF, PBX, and radio line. Converse with the connected party during each mode of connection for each line. For each radio line connection, switch the radio receive path to the local loudspeaker and back to the conference by operation and reoperation of the radio line key. Rering or resignal each dc and SF residence line and the manual PBX line as appropriate during the outgoing or incoming call by operation of the LOCAL RECALL key. During one incoming call, operate the audible cutoff (AUD CO) key while the bell is ringing. During one incoming or one outgoing call, operate the loudspeaker (LD SPKR) key to connect console loudspeaker to local link. When the various tests associated with each line are completed, the lines may be released by either of the two line release procedures.	Ascertain that all visual and audible signals are present when outgoing and incoming calls are placed and during rering. When the radio line receive path is switched from the conference to the local loudspeaker and back, the distant end voice should leave the conference, be heard from the loudspeaker, and then return to the conference in accordance with the switching. Operation of the LOCAL RECALL key during a call will cause a rering or resignal at the distant end that may be heard by the attendant and reported by the distant end party. Operation of the AUD CO key will silence the bell on an incoming call. Operation of the LD SPKR line key during a call will place the conversation on the console loudspeaker. The console loudspeaker should cut off when the attendant operates the push-to-talk key on the attendant handset.
3	If Step 1 was performed, perform the remaining associated tests in Steps 3 and 4 of Test C.	See Test C, Steps 3 and 4.

**C. Recorders 3 and 4 and Console Loudspeaker**

1	Operate the #3 REC line key and #4 REC line key. This connects recorders 3 and 4 to local link and starts both units recording.	Ascertain that all visual and audible signals are present for Steps 1 through 4, including operation of tape index indicators while recorders are in use. Transmission quality should be normal.
2	Place an outgoing call to a line and, when associated on the local link, converse with the distant end party to provide sound for the recorders in Step 1.	
3	Stop recorders 3 and 4 and rewind both recorders for a short distance. Play back first recorder 3, then recorder 4 to determine recording quality. Operate the volume control located on console.	Recorder playback should be heard through console speaker and should be of normal recording quality. Volume should increase and decrease as the volume control is varied. Loudspeaker volume cannot be reduced to an inaudible level.

STEP	ACTION	VERIFICATION
4	Check the 117-minute early warning alarm and the 120-minute end-of-tape alarm for recorders 3 and 4 as described for recorders 1 and 2 in Test A, Step 3.	See Test A, Step 3.

#### D. Multiple Key Operation

1	Select and operate simultaneously any two keys in any of the following four designations: (a) Line keys (b) Trunk keys (c) Local conference (LOCAL CONF) key (d) LOCAL LINK key	Connection will not be completed to the local link when two or more key selections are made simultaneously. The circuit will be inoperative. Flutter lamp may appear momentarily on the selected keys but will extinguish immediately. The circuit will remain inoperative and all lamps for the keys selected will remain dark as long as any of the simultaneously selected keys are held operated, or if any other key not previously selected is operated before release of all the selected keys.
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#### E. Line Transfer

##### Transfer from Local Link to Trunk or Local Conference and Single Transfer to Trunk, Local Conference, or Local Link

1	Place an outgoing call to two local lines.	Observe that all visual and audible signals are present, indicating that lines are answered.
2	Operate conference add key for any trunk or the local conference.	Observe that selected lines are transferred from the local link to the selected trunk or local conference.
3	Operate the line key for one of the lines in the selected conference.	Visual signals should be present, indicating that the attendant is associated with the selected line and disconnected from the selected conference trunk.
4	Operate the conference add key for either the local link, the local conference, or a trunk other than the one on which lines are conferenced in Step 2.	Ascertain that all visual signals are present, indicating that the line selected for transfer completed the transfer to the selected conference and that transmission quality with the party is normal on the new conference. Observe by visual signal that the line which was not transferred is still connected to the conference selected in Step 2.
5	If the selections made in Step 2 or 4 are JCSAN trunks, the recorder 1 or 2 (whichever applies) should be rewound or, if desired at this point, the recording quality and tape alarms may be checked as described in Steps 2 and 3 of Test A.	See Test A, Steps 2 and 3.

STEP	ACTION	VERIFICATION
6	Steps 1 through 5 may be performed for other lines by pairs or by larger groups if desired.	
<b>Group Transfer Option</b>		
7	If group transfer option is provided, Steps 1 through 6 may be used to transfer the lines to the local conference. If Steps 1 through 6 have not been performed, place an outgoing call to two local lines and operate the conference add key for the local conference.	Ascertain that all visual and audible signals are present, indicating that the selected lines have been transferred to the local conference from either the local link or from the trunks involved (whichever applies) in Steps 1 through 6.
8	Operate and hold the group transfer (GROUP TRFR) key followed by the operation of one of the trunk conference add keys.	Ascertain that all visual signals are present, indicating that both lines are transferred from the local conference to the selected trunk and that transmission quality is normal for both parties on the new conference.
9	Step 8 may be repeated to transfer the selected lines as a group from trunk to trunk.	Same as Step 8 for transfer from previous trunk selected to new trunk.
10	Upon completion of Steps 1 through 9 (1 through 6 if group transfer option is not provided), release the lines selected in Step 1 (or Step 7) by either one of the two line release procedures.	Verify that the conference is terminated and the visual signals associated with the conference are extinguished.

#### F. Conferencing and Trunk Recall\*

1	Place an outgoing call to one or more local lines.	Observe that all visual and audible signals are present, indicating that the selected line or lines and attendant position are connected to the local link and that transmission quality is normal.
2	Operate the conference add key for the DDD trunk.	Visual signals should indicate that lines selected in Step 1 have transferred to the DDD trunk. Transmission quality should be normal between attendant and distant ends of selected lines.
3	Operate the DDD trunk key and place an outgoing call on the DDD trunk.	Ascertain that visual and audible signals indicate that the conference is connected to the DDD trunk distant end. Normal transmission quality should be evident between the attendant and the distant end parties on the lines and the DDD trunk.
4	Inform trunk distant end that a disconnect will be initiated at the local end and that when it occurs, the distant end should hang up and await a call back from the local end.	

\*The trunk recall feature applies only to DDD and AUTOVON trunks.

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<b>STEP</b>	<b>ACTION</b>	<b>VERIFICATION</b>
5	Operate the LOCAL RECALL key.	Distant end party on trunk selected in Step 2 is disconnected and dial tone is heard. Ascertain that attendant telephone and line or lines selected in Step 1 are still in conference on selected trunk bridge.
6	Place a second outgoing call on same trunk selected in Step 2.	Distant end party answers for second time to rejoin the conference from which party was disconnected in Step 5. Ascertain that all visual signals are present, indicating re-establishment of the conference.
7	Transfer the lines selected in Step 1 to one of the AUTOVON trunks by operating the group transfer (GROUP TRFR) key (if provided) and the selected AUTOVON trunk conference add key. If group transfer option is not provided, transfer the lines by selecting the line keys one at a time and operating the conference add key for the selected AUTOVON trunk each time until all selected lines are transferred.	Ascertain that visual signals indicate that lines and attendant telephone have been released from the DDD trunk and transferred to the AUTOVON trunk. Transmission should be normal between attendant and lines after transfer.
8	Repeat Steps 1 through 6 except for the AUTOVON trunk selected in Step 7 (AUTOVON trunk release from distant end is necessary to release distant end local trunk before Step 6 can be completed).	Ascertain that all visual and audible signals are present as in Steps 1 through 6 and that AUTOVON distant end party joins attendant and lines connected in conference.
9	Repeat Steps 7 and 8 to check remaining AUTOVON trunk.	
10	Upon completion of tests in Steps 1 through 9, release the lines selected in Step 1. Request party at distant end of AUTOVON trunk to disconnect trunk.	Conference will be terminated and line and trunk lamps will be extinguished as released.

**G. Noncolor Conference Identification\***

1	Place outgoing call to two or more lines and transfer them to either the local conference or to one of the trunks <i>other than</i> JCSAN or direct (i.e., DDD or AUTOVON).	Ascertain that all audible and visual signals are present, indicating that the attendant position is conferenced with the selected lines on the selected conference bridge.
2	Operate the identification (IDENT) key and hold operated long enough to identify conference.	Observe that visual signal is present on the selected line keys and selected trunk or local conference (LOCAL CONF) key as long as the IDENT key is held operated.

\*Noncolor-identified trunks are those other than JCSAN or direct. The JCSAN and direct trunks are identified by colored lamps on the bridge indicators which light automatically when the associated line is connected to one of the color-identified trunks.

STEP	ACTION	VERIFICATION
3	Release IDENT key.	Visual signal should extinguish on selected line keys but should remain on the trunk or LOCAL CONF key selected in Step 1.
4	Operate line key of one of the lines in conference and repeat Steps 2 and 3.	Same as Steps 2 and 3 except when IDENT key is released, visual signal should remain only on the line key with which attendant is associated.
5	Steps 1 through 4 may be repeated for other lines and other DDD or AUTOVON trunks.	

#### H. Position Lock

1	Operate local conference (LOCAL CONF) key.	Visual signals should indicate that attendant is associated with local conference.
2	Operate and release POSITION LOCK key.	POSITION LOCK key lamp should light steadily.
3	Operate line key for assistant attendant telephone, followed immediately by operation of a selected line key.	Assistant attendant and selected line should be connected to the local link and be able to converse. In addition, all visual indications should verify the connection. The attendant should not be able to hear the conversation through the attendant telephone set.
4	As a further check of the effectiveness of the position lock feature, the assistant attendant should transfer the selected line to a bridge other than the local conference where the attendant is position locked and then transfer the line back to the local link.	Visual signals should indicate that the assistant attendant and the selected line are transferred from the local link to the selected bridge and then back to the local link. The assistant attendant should be able to converse with the distant end party at all times. Visual signals should also indicate that the attendant remains associated with the local conference.
5	Again operate and release the POSITION LOCK key, followed by operation of the LOCAL LINK key.	Attendant should be connected to the local link, where the assistant attendant and the selected line are connected. This indicates proper release of the position lock.
6	Release the selected line, assistant attendant, and attendant by either one of the two line release procedures.	The assistant attendant telephone, selected line, and the attendant telephone are released from the local link. All associated lamp signals are extinguished.

#### I. Local and Remote Control Option

1	If the local and remote control option is provided, establish communication with the remote console in preparation for the following tests.	
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<b>STEP</b>	<b>ACTION</b>	<b>VERIFICATION</b>
2	To give control to the remote console, operate the remote control (REMOTE CONT) key.	All visual signals should be present. Control of JCSAN trunks is transferred to remote console.
3	Place an outgoing call on an idle JCSAN trunk.	No tone is heard.
4	To take control from the remote console, operate the local control (LOCAL CONT) key.	All visual signals should be present. Control of JCSAN trunks is transferred to the local console.
5	Place an outgoing call on an idle JCSAN trunk.	Connection will be made as described in Test A.
6	Release the JCSAN trunk selected in Step 5 by going on-hook.	Trunk will be released and associated lamp signals will be extinguished when the distant end goes on-hook.