

TYPE N1 CARRIER TELEPHONE SYSTEM
GENERAL INFORMATION—TERMINAL EQUIPMENT
INITIAL LINE-UP AND MAINTENANCE TESTS

1. GENERAL

1.01 This section includes the operating instructions for initial and maintenance tests on the terminal equipment of the N1 carrier telephone system.

1.02 This section is reissued to include current information and to add initial line-up and system line-up tests (Tables A and B, respectively). Because of the general revision, marginal arrows usually used to indicate changes have been omitted.

1.03 The information in this section is intended to be used after the terminal equipment and repeater equipment have been installed and the equipment and line facilities are ready for the tests and adjustments preparatory to placing the carrier system in service. The information also applies to the operation and maintenance of the system while it is in service.

1.04 The increasing sensitivity of present-day traffic to hits and interruptions emphasizes the necessity for closely following operating procedures which reduce to a minimum the number of circuit interruptions and irregularities which affect circuit operation. It is necessary to apply test and operating procedures without omitting any steps in order to avoid irregularities which are likely to result from the use of abbreviated or unauthorized procedures.

1.05 All trunks and special-service circuits assigned to carrier channels should be made busy or patched out before tests and adjustments which may cause service interruptions are attempted. Note especially that the trunk release and make-busy circuit automatically makes the circuits busy during a carrier failure. Since this can interrupt service on all channels, care must be taken to avoid false operation of the trunk release and make-busy circuit.

Caution: All work operations on an in-service basis should be performed carefully to avoid hits or service interruptions. The trunks or special-service circuits associated with the carrier system may be carrying DATA-PHONE, SAGE, voice-frequency telegraph, or other data service.

1.06 Testing and switching apparatus should be calibrated and maintained in accordance with standard instructions as outlined in Bell System Practices. The calibration of testing apparatus is important, since failure to meet test requirements may be caused by improper alignment of the testing apparatus.

2. INITIAL TESTS

2.01 Tests indicated in the sections listed in Table A must be performed on both terminals in the order shown before a system is placed in service.

2.02 *System Line-Up:* The tests in Table B are made when a system is first lined up terminal-to-terminal.

3. MAINTENANCE TESTS

3.01 The tests listed in Table C are made on a periodic basis and, where practicable, in the order shown. The purpose of the tests is to detect apparatus which has developed trouble or has deviated from normal to the point where its remaining in service might cause service impairment. In addition, some of the terminal tests will serve to indicate variations in the high-frequency line which require corrective measures.

3.02 The tests listed in Table D should be made when electron tubes are replaced in the various units.

3.03 The tests listed in Table E should be made, in the order shown, when the indicated plug-in units are replaced.

TABLE A
INITIAL LINE-UP TESTS

TEST	SECTION REFERENCE
Check of Local Cabling, Span Pads, Artificial Lines, Slope Networks, and Noise Control Unit	362-015-501
Electron Tube Repeatered Systems — Adjustment of Power Supply and Sealing Current to an Adjacent Repeater	362-015-502
Transistorized Repeatered Systems — Adjustment of Power Supply to Adjacent Repeaters	362-015-515
Heater Supply Voltage Adjustment	362-020-501
Check of Alarm Operation	362-020-503
Blower Operation	161-452-701

TABLE B
SYSTEM LINE-UP TESTS

TEST	SECTION REFERENCE
<i>Channel Unit</i>	
Message Channel Unit (J98703F and J98703FA)	362-330-501
Channel Unit Without Signaling (J98703AP)	362-330-502
Thru Channel Unit (J98703AH)	362-330-503
Special Services Channel Unit (J98703AM)	362-330-504
Schedules C and D Program Channel Unit (J98703TA)	362-330-505
Schedules A and B Program Channel Unit (J98703W)	362-330-506
Amplas Channel Unit Without Signaling (J98703BP)	362-330-507
<i>Group Unit</i>	
Transmitting — Individual Carrier Output — Terminated	362-025-501
Transmitting — 3700-Cycle Oscillator Output	362-035-501
Transmitting — Total Carrier Power Output	362-035-502
Receiving — Total Carrier Power Output	362-040-501
Receiving — Individual Carrier Power Output	362-040-502
<i>Fuse and Alarm Panel</i>	
Check of Alarm Operation	362-020-503

TABLE C
PERIODIC MAINTENANCE TESTS

TEST	TEST PERIOD*	SECTION REFERENCE
Heater Supply Voltage Adjustment	6M	362-020-501
Blower Operation	6M	161-452-701
<i>Channel Unit</i>		
Compressor Tests and Adjustments (Modified Units Only)	6M	362-025-502
Channel Carrier Output (at M2 Jack)	4M	362-025-501
Bridged Measurement of Transmitted Carrier	2Y	362-025-501
Measurement of Individual Channel Carrier at the R1 Jacks	4M	362-030-501
Expander Output (With or Without Signaling)	4M	362-305-501
Channel Noise Measurement (Except Impulse Noise)	6M	362-305-510
Channel Net Gain and Expander Output Check	6M	362-305-501
Overall Pulsing Test (Dial Signaling Channels Only)	4M	362-305-515
<i>Group Unit</i>		
Electron Tube Cathode Activity Measurements	4M	362-020-502
3700-Cycle Oscillator Output (Level, Frequency, and Waveshape)	6M	362-035-501
Total Carrier Power Output (Transmitting Group Unit)	4M	362-035-502
Total Carrier Power Output (Receiving Group Unit)	4M	362-040-501
Receiving Individual Carrier Output	2Y	362-040-502

* 4M = 4 Months

6M = 6 Months

2Y = 2 Years

TABLE D
ELECTRON TUBES REPLACEMENT TESTS

TUBE REPLACED	TEST TO BE MADE	SECTION REFERENCE
<i>Channel Unit</i>		
V1, V2 V43, V44	Compressor Tests and Adjustments Expander Output Channel Noise Measurement Channel Net Gain and Expander Output Check	362-025-502 362-305-501 362-305-510 362-305-512
V101, F Units FA Units	Channel Carrier Output Channel Carrier Output (Set M2 to Recorded Value)	362-025-501 362-025-501
V102	Channel Regulator and Demodulator Output Tests and Adjustments Channel Expander Test Channel Net Gain	362-030-501 362-305-501 362-305-512
V41, V42, V45, or K41 Relay	Channel Signal Receiver and Overall Pulsing Tests	362-305-515
<i>High-Group Transmitter</i>		
V1, V2, V3	Electron Tube Cathode Activity Test Total Carrier Power Output	362-020-502 362-035-502
<i>Low-Group Transmitter</i>		
V1, V2, V3, V40, V41	Electron Tube Cathode Activity Test Total Carrier Power Output	362-020-502 362-035-502
V41	3700-Cycle Oscillator Output (Level, Frequency, and Waveshape)	362-035-501
<i>High-Group Receiver</i>		
V1, V2, V3	Electron Tube Cathode Activity Test Total Carrier Power Output	362-020-502 362-040-501
<i>Low-Group Receiver</i>		
V1, V2, V3, V40, V41	Electron Tube Cathode Activity Test Total Carrier Power Output	362-020-502 362-040-501
V41	3700-Cycle Oscillator Output (Level, Frequency, and Waveshape)	362-035-501

TABLE E
PLUG-IN REPLACEMENT TESTS

UNIT REPLACED	TEST TO BE MADE	SECTION REFERENCE
<p><i>Channel Unit</i></p> <p>(All tests should be performed at both terminals)</p>	<p>F Unit Channel Carrier Output FA Unit Channel Carrier Output (Set M2 Jack to Recorded Value)</p> <p>Compressor Tests and Adjustments Channel Regulator and Demodulator Output Tests and Adjustments Expander Test Channel Noise Measurement Channel Net Gain and Expander Output Check Channel Signal Receiver and Overall Pulsing Tests</p>	<p>362-025-501 362-025-501 362-025-502 362-030-501 362-305-501 362-305-510 362-305-512 362-305-515</p>
<p><i>Group Transmitter</i></p>	<p>Total Carrier Power Output Channel Regulator and Demodulator Output Tests and Adjustments (Far End)</p>	<p>362-035-502 362-030-501</p>
<p><i>Group Receiver</i></p>	<p>Total Carrier Power Output Channel Regulator and Demodulator Output Tests and Adjustments (Replacing End)</p>	<p>362-040-501 362-030-501</p>