REPLACING PAGE ADDENDUM
Filing Instructions:
1. REMOVE FROM THE SECTION THE PAGES NUMBERED THE SAME AS THOSE ATTACHED TO THIS PINK SHEET.
2. INSERT THE ATTACHED PAGES INTO THE SECTION IN THEIR PLACE.
3. PLACE THIS PINK SHEET AHEAD OF PAGE 1 OF THE SECTION.

MULTIFREQUENCY OUTGOING SENDERS

TESTS USING OFFICE TEST FRAME TEST CIRCUIT SD-27633-01 (H-595-950)

NO. 5 CROSSBAR OFFICES

1. GENERAL

1.001 This addendum supplements Section 218-456-501, Issue 3. The attached pages must be inserted in the section in accordance with filing instructions above.

1.002 This addendum is reissued to add Test U to provide testing procedures to charge for directory assistance calls and to make minor changes as required.

This addendum affects Equipment Test Lists.

The following change applies to Part 1 of this section:

Test U—added

3. PREPARATION

The following change applies to Part 3 of this section:

Test U—added

4. METHOD

The following change applies to Part 4 of this section:

Test U—added.

Attached:

Page 1 dated September 1974, reissued
Page 2 dated September 1974, revised
Page 3 dated September 1974, revised
Page 4 dated September 1974, revised
Page 4.1 dated September 1974, revised
Page 17 dated July 1971, reissued
Page 18 dated July 1971, revised
Page 19 dated July 1971, revised
Page 20 dated July 1971, revised
Page 20.1 dated July 1971, added
Page 23 dated September 1974, added
Page 24 dated September 1974, added

MULTIFREQUENCY OUTGOING SENDERS
TESTS USING OFFICE TEST FRAME TEST CIRCUIT SD-27633-01 (H-595-950)
NO. 5 CROSSBAR OFFICES

1. GENERAL

1.01 This section describes a method of testing multifrequency outgoing senders in No. 5 crossbar offices using the office test frame test circuit (OTF) SD-27633-01, Issue 1, and the trouble indicator and connector circuit (TIC) SD-27634-01, Issue 1.

1.02 This section is reissued for the following reasons:

(a) To revise the title of the section to include the SD- and H- numbers of the office test frame test circuit.

(b) To revise Test J to test that sender progress is stopped at the trouble point when option YC is provided.

(c) To modify the verification of Test A to replace E lamp with IE, AE, and DE lamps for an AMA class of service.

(d) To add 1.10 to this section to indicate an operated condition of the TIC MB key in unattended offices.

(e) To make minor changes as required.

1.03 The test covered are:

PAGE

*A. **Regular Call:*** This test checks that the sender records information from a marker and that it outpulses interoffice calls on AMA or non-AMA basis. The transmitting of information to the transverter is checked on AMA class calls. . . . 6

*B. **Trunk Test—Open Trunk:*** This test checks that the sender detects an open trunk during trunk test and causes an overflow tone to be sent after definite time-out intervals. 7

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*C. **Abandoned Call—AMA:*** This test checks that the sender waits until the initial AMA entry has been made before releasing. 8

*D. **Abandoned Call—Non-AMA:*** This test checks that the sender releases at any stage of a call. 9

*E. **AMA Transverter Trouble Release:*** This test checks that the sender operates its RA relay, sets the trunk to overflow, and releases when the transverter fails on both first and second trial on a detail-billed call. 10

*F. **Delay Pulsing of Last Digit on AMA Call:*** This test checks that the sender delays sending the last digit until AMA functions are completed. . 10

*G. **No-Pulse AMA Call:*** This test checks that the sender releases without pulsing on a no-pulse AMA call. It also checks that when the sender is set to reorder, it does not release on an abandoned intraoffice message call until the transverter releases. 11

*H. **Reversed Trunk:*** This test checks that the sender sets the trunk to overflow and that the sender releases when supervision is reversed to off-hook after the start pulse signal. 12

*I. **Timing Features:*** This test checks that the sender releases and sets the trunk to overflow in 14 to 22 seconds if it cannot complete its functions. It also checks, when the sender is arranged for reduced timing for transverter operations, the sender sets the trunk to return overflow and that the sender

PAGE

releases if the transverter has not completed its functions within 7 to 11 seconds. 12

J. Cancel Timed Release and Alarm: This test checks that, with the associated CTR_ key operated, the sender will not release when it times out and will operate the stuck sender alarm. It also checks that if the call is abandoned at this time the sender will not release. If the alarm sending circuit is provided, this test also checks that when the alarms are transferred the sender cancel-timed-release feature is disabled. Option YC, to stop sender progress at trouble point, is tested when provided. 13

K. Marker Reorder: This test checks that the sender sets the trunk to overflow and that the sender releases when the marker calls for reorder. . 14

L. Intersender Timing: This test checks that the sender sets the trunk to overflow and that the sender releases if start pulsing polarity is not returned within 4 to 8 seconds after trunk test and the marker finds all senders in the sender group busy. 15

M. Sender Busy: This test checks that the sender appears busy when used on a service call or when made busy at the associated SMB_ jack. 16

FOR SENDERS USING MULTIFREQUENCY CURRENT SUPPLY

N. Multifrequency Current Supply Trouble Release: This test checks that the sender sets the trunk to overflow and that the sender then releases when the multifrequency current supply is transferred during pulsing. 16

FOR SENDERS EQUIPPED WITH MULTIFREQUENCY GENERATOR

O. Comparative Frequency: This test makes an appraisal of an oscillator output frequency by using a nearby oscillator of the same frequency as a beat frequency oscillator. 17

P. Oscillator Output Voltage: This test checks that each oscillator output voltage is within prescribed limits. . 18

Q. Frequency Test Using Frequency Meter: This test checks, by using a frequency meter, that the output frequency of each oscillator is within prescribed limits. 19

R. Automatically Identified Call: This test checks that when the calling number has been received from the ANI transverter, the sender transmits a KP signal, information digit 0 for nonobserved calls, and digit 3 for observed calls, calling numbers, and ST signal. 20

S. Operator Identified Call: This test checks that, when the sender handles a call from a multiparty customer in which automatic identification of the calling number is not possible, the sender transmits a KP signal, information digit 1 for nonobserved calls, and digit 4 for observed calls. 21

T. Automatically Identified Call Failure: This test checks that, when the ANI transverter fails on both first and second trial, the sender transmits a KP signal, information digit 2 for nonobserved calls, and digit 5 for observed calls. 22

U. Directory Assistance Charging: This test checks the ability of the sender to record the called number structure and called number class for directory assistance calls. . . . .

1.04 It is expected that Test O will normally be used to make a comparative frequency test of an oscillator output. When the results of this test are not within the limits specified, or when a precise measurement of a frequency is required, Test Q should be performed.

1.05 If it is found that the oscillator output voltage or frequency is not within the limits specified in the test, the requisite corrective measures will be found in the circuit notes which are part of SD-26051-01.

1.06 In performing the following tests, action and verification are required in the locations indicated.

Test B	Action at marker frame.
Tests C, D, F, G,	Action and verification at sender frame.
Test E	Action at translator frame.
Test J	At sender frame and also requires alarms transferred for short interval during test.
Test L	At sender and multifrequency supply circuit.

1.07 Tests L and M require that all senders in a sender group be made busy.

1.08 ***Lettered Steps:*** A letter a, b, c, etc, added to a step number in Parts 3 and 4 of this section, indicates an action which may or may not be required depending on local conditions. The condition under which a lettered step or a series of lettered steps should be made is given in the ACTION column, and all steps governed by the same condition are designated by the same letter within a test. Where a condition does not apply, all steps designated by that letter should be omitted.

1.09 Local instructions should be followed for recording and reporting plant register operations for registers associated with sender SS leads.

1.10 The TIC MB key should be operated in unattended offices to prevent lamps from being lighted and generating heat sufficient to discolor or warp designation strips. A large number of lamps lighted will also result in lamp fuses operating and causing a major alarm.

2. APPARATUS

2.01 The apparatus required for each test is shown in Table A. The details of each item are covered in the paragraph indicated by the number in parentheses.

2.02 Testing cord, 893 cord, 6 feet long, equipped with two 360A tools (1W13B cord) and two KS-6278 connecting clips (to connect ground).

2.03 Test receiver, 716C receiver attached to a W2AB cord, equipped with two 360A tools (2W21A cord) one KS-6278 connecting clip, and one 411A (test pick) tool (to check for the presence or absence of battery or ground).

2.04 Test receiver, 716C receiver attached to a W2AB cord, equipped with two 360A tools (2W21A cord), and two 624B (test connector) tools (to make test connections to terminals arranged for solderless-wrapped connections).

2.05 Electron tube voltmeter, Voltohmyst, RCA WV-98A Senior, or equivalent (for measuring oscillator output voltages).

2.06 Testing cord, 893 cord, 6 feet long, equipped with two 360A tools (1W13B cord), one 624B (test connector) tool, and one KS-6278 connecting clip.

2.07 Load resistor, 19LM or equivalent, 275 ohms ± 1 percent.

2.08 Load resistor, 19SE or equivalent, 1100 ohms ± 1 percent.

2.09 Frequency meter, Berkley EPUT or Hewlett-Packard 521C counter with 10-second gates.

2.10 Testing cord, Pomona Electronics MG-C-BNC-36 cable assembly, 3 feet long, equipped with one UG-88C coaxial connector and two alligator clips (red clip connected to cable center conductor, black clip connected to shield) (for use with Berkley EPUT meter).

TABLE A

APPARATUS	TESTS																			
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
Office test frame	1	1	1	1	1	1	1	1	1	1	1	1	1	1	—	—	—	1	1	1	1
322A (make-busy) plugs	—	—	—	—	—	—	—	—	√	—	—	√	√	√	√	√	√	√	√	√	√
Cord (2.02)	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—
Receiver (2.03)	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—
KS-3008 stopwatch or equivalent	—	1	—	—	—	—	—	—	1	—	—	1	—	1	—	—	—	—	—	—	—
Receiver (2.04)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—
Electron tube voltmeter (2.05)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—
Cord (2.06)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	—	—	—	—
Load resistor (2.07)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—
Load resistor (2.08)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—
Frequency meter (2.09)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—
Cord (2.10)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—
Cord (2.11)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	√	—	—	—	—
Clip (2.12)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	√	—	—	—	—
Cord (2.13)	√	√	√	√	√	√	√	√	√	√	√	√	—	√	—	—	—	√	√	√	√
Cord (2.14)	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Cord (2.15)	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Tools (2.16)	—	√	√	—	—	√	√	—	√	√	√	√	√	—	√	√	√	—	—	—	—
32A Test Set	—	—	1	1	—	1	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—

√ As required.

2.11 Testing cord, Hewlett-Packard 11001A cable assembly, 45 inches long, equipped with one UG-88C coaxial connector and one dual banana plug (plug nearest knurled section connected to cable center conductor) (for use with Hewlett-Packard 521C cord).

2.12 No. 60 Mueller clip for use with Hewlett-Packard 11001A cable assembly.

2.13 Patcing cord, P3D cord, 6 feet long, equipped with two 309 plugs (3P3A cord) as required.

2.14 Patching cord, P3E cord, 6 feet long, equipped with two 310 plugs (3P7A cord).

2.15 Testing cord, W2W cord, 10 feet long, equipped with one 310 plug (2W17C cord), one 360B tool, one 360C tool, one 624A (terminal connector) tool, and one 624B (terminal connector) tool.

2.16 Blocking and insulating tools as required. Use tools and apply, as covered in Section 069-020-801.

3. PREPARATION

STEP	ACTION	VERIFICATION
Test A Through L, N, R, S, T, and ▶U◀		
1	At OTF— Restore all keys and switches.	
2	At jack, lamp, and key circuit— Restore (push-in) CTR_ key associated with sender under test.	
3	Patch SDR jack in MB2 jack field to SMB_ jack for sender to be tested.	
4	Patch 0-9 jacks in MB1 jack field to SMB_ jacks of all other senders in same sender group.	
5a	If particular trunk is required— Operate FS_, NT keys to select trunk link frame on which trunk appears.	

STEP	ACTION	VERIFICATION
19e	If 1-4, 2-5, 3-6 keys are provided— At multifrequency current supply— Operate 1-4, 2-5, or 3-6 keys associated with sender being tested.	
20	At sender under test— Connect ground to terminal 15 on C terminal strip.	
21	At OTF— Operate CL_ key.	
22	Operate ST key.	At completion of dialing— Overflow tone heard.
23	Restore ST key.	
24e	If 1-4, 2-5, 3-6 keys are provided— At multifrequency current supply— Restore 1-4, 2-5, or 3-6 keys.	
25	At sender under test— Remove test connection from terminal strip.	
26	At jack, lamp, and key circuit— Remove patch cords and plugs not required for next test.	
27	At OTF— Restore all keys and switches not required for next test.	

FOR SENDERS EQUIPPED WITH MULTIFREQUENCY GENERATOR

O. Comparative Frequency Test

1	At jack, lamp, and key circuit— Insert make-busy plug into MB_ jack of sender being tested.	
2	Insert make-busy plug into MB_ jack of sender (having oscillators known to be at proper frequencies) to be compared with sender being tested.	
3	At each sender made busy— Block operated ON relay.	
4	Connect one of 624B tools of test receiver to terminal M12 of each sender. ***Note:*** If senders are not within reach of the cords, locally available cords may be used to extend the reach of the cord provided with the test receiver.	

STEP	ACTION	VERIFICATION
5	Listen for beat frequency.	Oscillator frequency is satisfactory if beats can be counted (usually 5 or less per second).
6	Remove test receiver connections.	
7	Repeat Steps 4 through 6 to test each frequency, substituting, in turn, following terminals for terminal M12 in Step 4: M15, M21, M22, M25, M35.	
8	Remove all test cords.	
9	Remove blocking tools from ON relay.	
10	At jack, lamp, and key circuit— Remove plugs.	

P. Oscillator Output Voltage

1	At jack, lamp, and key circuit— Insert make-busy plug into MB_ jack of sender being tested.	
2	At sender under test— Connect ▶275◀ ohm resistor to terminals M11 and M12, using 893 cords; 624B tools provide means for connecting to M_ terminals, KS-6278 connecting clips provide means for connecting to resistor.	
3	Set voltmeter to read ac volts in accordance with approved procedure for particular meter being used.	
4	Block operated ON relay.	
5	Connect voltmeter GND terminal to side of resistor connected to terminal M11.	
6	Touch voltmeter probe to side of resistor connected to terminal M12.	▶Output voltage between 1.25 and 1.75 volts. ***Note:*** If output voltage is not within limits specified, proceed as outlined in notes accompanying schematic drawing. (Refer to 1.05)◀

STEP	ACTION	VERIFICATION
7	Disconnect meter and 275-ohm resistor.	
8	Repeat Steps 2 through 7 as required, to check output voltage of each oscillator, substituting the following terminals, in turn, for terminal M12 in Steps 2, 6, 11: M15, M21, M22, M25, and M35.	
9	Remove blocking tool from ON relay.	
10	At jack, lamp, and key circuit— Remove plug from MB_ jack.	

Q. Frequency Test Using Frequency Meter

1	At jack, lamp, and key circuit— Insert make-busy plug into MB_ jack of sender being tested.	
2	At sender being tested— Connect 1100-ohm resistor to terminal M11 and to first terminal in Table C, using 893 cords; 624B tool provides means for connecting to M_ terminals, KS-6278 connecting clips provide means for connecting to resistor.	

TABLE C

M. TERMINAL	OSCILLATOR OUTPUT FREQUENCY	MAXIMUM PERMISSIBLE VARIATION IN CYCLES PER SECOND
M12	700	698 to 705
M15	900	897 to 906
M21	1100	1097 to 1108
M22	1300	1296 to 1309
M25	1500	1497 to 1510
M35	1700	1695 to 1712

STEP	ACTION	VERIFICATION
3	◗Connect testing cord to frequency meter.	
4	Connect clip associated with shield of testing cord to side of resistor connected to M11.	
5	Connect clip associated with center conductor of testing cord to side of resistor connected to M12.◖	
6	Block operated ON relay.	
7	Measure frequency.	Frequency is within limits indicated in Table C. ◗***Note:*** If output frequency is not within limits specified, proceed as outlined in notes accompanying schematic drawing. (Refer to 1.05.)◖
8	Move test connection from terminal used in Table C to next terminal indicated in same table.	
9	Repeat Steps 6 through 8 until all frequencies are tested.	
10	Remove all test connections.	
11	Remove blocking tool from ON relay.	
12	At jack, lamp, and key circuit— Remove plug from MB_ jack.	
R. Automatically Identified Call		
18	At jack, lamp, and key circuit— Insert make-busy plug into TCMB jack of transverter to be used for test.	
19	At OTF— Operate OGT, CL_, TV_, TVR_, 2TR, OTLP keys.	
20	Patch OTL jack to SP jack.	
21	At link link frame— Patch SP jack to primary line switch vertical for individual class of service used for test.	

STEP	ACTION	VERIFICATION
22	At OTF— Operate ST key.	OS lamp lighted. At completion of dialing— ED lamp lighted. At TIC— FU 2/5, VG 2/6, RG 2/5, VF 1/5, TV, TPT or RPT, DNK, A_ through E_ lamps lighted. A_ lamp indicates automatically identified call and B_ through E_ lamps indicate calling line number.

STEP	ACTION	VERIFICATION
U. ▶Directory Assistance Charging		
18	At OTF— Operate OGT key.	
19	Operate CL_ key for class of service requiring AMA routing.	
20	Operate TV_, TR keys.	
21e	If test is for 411 2-line entry— Operate A_, B_, C_ DIAL switches, to select AMA route served by sender under test.	
22e	Operate A_, B_, C_ SDR switches, corresponding to digits outpulsed by sender.	
23e	Operate 3SD key.	
24f	If test is for 555 - 1212 2 - or 4 - line entry— Operate A_ through G_ DIAL switches to select AMA route served by sender under test.	
25f	Operate 7SD key.	
26	Operate ST key.	OS lamp lighted. At completion of dialing— ED lamp lighted. At completion of sender outpulsing— EP, CS lamps lighted. High tone heard. TOK lamp lighted. At TIC— DR_, CN_, S_, FU_, VG_, HG_, VF_ lamps lighted identifying transverter, transverter connector, sender, and originating test line. OFF_, RN_, CIIT_, CITU_ lamps lighted identifying originating office group, recorder number, and call identity index trunk number. If test is for 411 or 555-1212 2-line entry— A_, B_, C_, or A_ through G_, MB6, CI1, CI2 lamps lighted identifying called number, message billing index, and cut-in perforator leads. If test if for 555-1212 4-line entry— A_ through G_, MB9, CI1, CI2, CI3, CI4 lamps lighted identifying called number, message billing index, and cut-in perforator leads.

STEP	ACTION	VERIFICATION
		Note: Disregard XP1 lamp if lighted.
27	At OTF— Restore ST key.	All lamps extinguished. High tone silenced.
28	At TIC— Momentarily operate RLS key.	All lamps extinguished.
29	At OTF— Restore all keys and switches not required in next test.	
30	Remove patching cords from SDR jacks in MB1 and MB2 jack fields and SMB_ jacks of all senders made busy in Steps 3 and 4.	
31a	If a particular trunk is required— Remove make-busy plugs from MB_ and TS_ jack associated with selected trunk.	