INCOMING TRUNK TEST FRAME SD-25161-01

DESCRIPTION AND OPERATION

NO. 1 CROSSBAR OFFICES

CONTENTS PAGE

1. GENERAL

1.01 This section provides general descriptive information on the operation and use of the incoming trunk test circuit SD-25161-01 as used in No. 1 crossbar offices.

1.02 This section is reissued to add references to the common systems message printer (CSMP) (which replaces the TTY as the standard recording device used by the incoming trunk test circuit), to add information to all the tables, and to revise Figure 1. Since this is a general revision, change arrows have not been used.

1.03 This test circuit is arranged to automatically establish connections to the outgoing office link frame terminals and to perform tests of the equipment associated with those terminals. In most cases, an outgoing trunk is associated with a terminal, and the major part of the relay equipment associated with this trunk is located at the incoming side of the distant office. For this reason, the test frame is called the incoming trunk test frame (ITT).

1.04 As each office link location is seized, the tip, ring, and S1 leads are connected to the test circuit and class relays are operated in the test circuit to indicate the type of equipment connected and the parameters of the test.

1.05 The ITT circuit may be started either manually or automatically under control of a time clock, and selection of the outgoing terminal is normally made on a sequential basis. As each location is seized, a test is made to determine if the terminal is idle. If the terminal is found idle, a test is made. The test is determined by key settings on the frame and cross-connections (see Section 216-720-301) associated with the class relays. If the test results are satisfactory, a register is

scored and the ITT circuit advances to the next location. If the test results are not satisfactory, the ITT will either block and alarm with the test results shown on a lamp display or a trouble indication will be printed on a teletypewriter, message printer, or ticketer before advancing to the next location.

1.06 Provisions are included to permit manual selection of a particular terminal for repetitive tests. A second test may be made at each location or at each location where a failure is encountered. Automatic passing of busy terminals is available under key control.

2. TEST CAPABILITIES

A. Operational Test

2.01 Of the various types of tests available to the ITT, the operational test provides the greatest opportunity to most nearly approach actual in-service operating conditions. The basic purpose of an operational test is to verify the ability of the trunk circuit to properly complete a service call and to perform marginal tests on the most critical trunk equipment components.

2.02 Basically, the test functions as follows. After the ITT has been properly set up and started, a test call is originated and passed via the incoming trunk circuit under test to an operational test line in the terminating office. When the test line is attached, additional checks are made of the trunk circuit relay equipment. After satisfactory completion of these checks and just prior to trunk disconnection, a test is made of the trunk circuit release sequence.

B. Operational Test Lines

2.03 There are several different types of operational test lines available to the ITT. The selection of the proper one is determined by the type of trunk circuit under test and the type of office where the trunk circuit terminates.

2.04 A ***synchronous test line*** is used in end offices to test ringing, ring-tripping, and supervisory features of incoming trunk circuit relay equipment. Important characteristics of this test line are as follows:

(1) Sends a pulse of fixed time duration to the ITT circuit for the purpose of synchronizing the ITT with the test line

(2) Checks for application of ringing signal

(3) Checks for pretripping of machine ringing during the silent interval

(4) Provides interrupted audible ringing tone during a 2-second ringing interval

(5) Checks for tripping of machine ringing during a 3-second silent interval

(6) Provides marginal test of incoming trunk circuit supervisory relay

(7) Provides a "tick-tock" audible signal at the rate of 120 IPM as an indication of completion of test.

2.05 A second type of synchronous test line is used in toll offices for testing trunk circuits not equipped with a rering feature. Operation is similar to that previously described, but with two exceptions as follows:

(1) Instead of audible ringing, test progress tone is returned before the synchronizing pulse.

(2) Instead of "tick-tock" audible signal, test progress tone is returned at the completion of test.

2.06 A ***nonsynchronous test line*** provides an operational test which is not as complete as the synchronous test; therefore, it should not be used when the synchronous test line is available. Nonsynchronous test lines give an immediate trip of machine ringing followed by 60 ipm loop reversals. Usually, low tone is returned during the off-hook state.

2.07 A ***rering test line*** requires ring forward signals from ITT to check rering feature of the trunk circuit under test. After two ring forward signals are received, the test line returns 120 ipm signal reversals to trunk circuit for the purpose of checking supervisory relay equipment.

2.08 An ***ANI Trunk Test*** is made to milliwatt (102 type) test lines. This test is used to verify that a call can be completed over the ANI trunk circuit. If E&M signaling is employed, verification is also made to determine that the signaling equipment is functioning correctly. ANI 0+ trunks to traffic service position offices are tested in a similar manner, with the exception that it is only necessary to outpulse three and not seven digits to reach the milliwatt test line.

2.09 A ***Centrex Trunk Test*** is made to a centrex synchronous test line which functions as previously described for a synchronous test line and also provides a check of the centrex trunk circuit transfer feature.

C. Busy Line Test

2.10 A Busy Line Test is made to end offices to provide a rapid integrity check of the incoming trunk circuit and to verify that the distant office trunk equipment will respond correctly when calling a number that is busy. An important test feature, which can only be performed on busy line type tests, is the nonoperate check of the incoming trunk circuit A relay. The ITT initiates a test call via the incoming trunk circuit to the number which is connected to the busy line. When the test frame recognizes a 60 ipm busy signal as an indication of satisfactory completion of the test, it will disconnect from trunk circuit under test and advance to next circuit to be checked.

D. Continuity and Polarity Test

2.11 The Continuity and Polarity Test is even more rapid than the Busy Line Test. It is normally made daily to locate trunk circuits that may be stuck off-normal or to detect cable pair faults. On trunk circuits not having outgoing relay equipment, the ITT will not seize the trunk but will verify that both tip and ring leads register proper polarity. On trunk circuits that do have outgoing relay equipment or on repeated supervision trunk circuits, the ITT places a seizure on the trunk equipment. However, upon receiving a start pulse signal from the distant office, the ITT releases the trunk and advances to the next circuit to be tested. The test frame will also place a seizure on permanent signal holding trunks, home office tone trunks, and voice announcement circuits to verify for proper polarity and the presence of an audible signal.

E. Brush Continuity Test

2.12 The Brush Continuity Test is made to panel incoming selectors or office selector tandems. It is possible with this test to direct panel trunk circuits to any group and determine if the selector brush contacts are properly closing. Incoming brush and group or office brush and group selections are made by inserting MB plugs into jacks.

3. MAJOR ASSOCIATED CIRCUITS

A. Tone Detector Circuit SD-94800-01

3.01 Test tone identification is a necessary task that must be accomplished if the ITT is to perform properly. To carry out this function, the tone detector circuit is connected via the ITT to the trunk circuit under test. Tone detection is actuated upon completion of outpulsing and is arranged to recognize busy tones, overflow tones, and voice announcements. Recognition of 1000-Hz tone is also required when testing ANI trunk circuits.

B. Teletypewriter Control Circuit SD-68456-01 (Using a Teletypewriter [TTY] or Common Systems Message Printer [CSMP], SD-94865-01, as the Recording Device)

3.02 The teletypewriter control circuit is designed to record, by means of a TTY or CSMP printout, the results of trunk circuit tests performed by the ITT. The TTY control circuit is made ready for use by operation of the PTR key at the ITT.

3.03 The TTY control circuit receives test result information from the ITT. When a teletypewriter is used, this information is decoded and supplied to the transmitting distributor in correct sequence for printing. The distributor, in turn, directs the TTY to print the proper test result characters on a single horizontal line (see Tables A and B). When a message printer is used, this information is decoded and supplied directly to it via 5-level baudot code. No distributor is required. The message is read and stored by the message printer. When the end of a message is encountered, the TTY control circuit, and subsequently the ITT, are released while the message printer proceeds with the task of printing. At completion of printing, a signal is forwarded to ITT indicating that a record has been made. Depending on the

situation, the ITT will advance to the next trunk to be tested, restore to normal, or block in the alarm condition.

C. Recorder-Ticketer Circuit SD-21978-01

3.04 While the TTY control circuit is the standard circuit for recording test result information, the recorder-ticketer may still provide this function in some No. 1 crossbar offices. To actuate recorder-ticketer circuit for printing test results, it is necessary to operate either of two keys located at the recorder. The MST key provides a manual start operation, while the AST key is operated when an automatic start of the test circuit is desired.

3.05 When ITT encounters a busy circuit or operational failure, it will start busy or trouble timing, respectively. If, at the end of either of these periods, the ITT has not advanced, it will signal the recorder circuit to print a ticket. The information for the ticket is transmitted to the recorder circuit over a number of leads and it will print in the following sequence:

(1) A symbol assigned to test frame

(2) Type of record (busy or trouble)

(3) Identity of the circuit under test

(4) The type of test (continuity and polarity, brush continuity, busy line, or operational test).

After the recorder circuit prints a ticket, it signals the ITT to advance to the next circuit to be tested. When end of cycle is reached, the ITT is restored to normal manually or by the recorder circuit if it was automatically started.

4. TEST CONTROLS AND INDICATORS

A. Keys

4.01 Numerous keys provide the flexibility required to control actuation of various test options available to the ITT. In Table C the keys are listed alphabetically and each key position is functionally described.

B. Jacks

4.02 Jacks provide additional controls of ITT operation plus miscellaneous maintenance aids. In Table D the jacks are listed alphabetically and are functionally described.

C. Lamps

4.03 In Table E the lamps are listed alphabetically and the significance of each lamp is described. Lamps are classified into four main categories as follows:

(1) ***Class***—Indication of test call features required

(2) ***Information***—Provides supplementary data

(3) ***Trouble***—Indication of test call failures

(4) ***Progress***—Indication of test call operation status.

D. TTY or CSMP Printout

4.04 A printout of test results is generated by the TTY control circuit. Tables A and B provide additional information that should prove useful to a better understanding of the printout format. Table A explains the printout format while Table B lists alphabetically the trouble characters with associated indicator lamps and general trouble categories.

E. Registers

4.05 Registration of ITT performance or lack of performance provides an indication of test frame effectiveness. When an analysis of test frame results is desired, the following registers can prove useful:

(a) ***CT Register***—Records the number of circuits tested satisfactorily when RST key is unoperated

(b) ***FFT Register***—Records the number of first test failures

(c) ***FST Register***—Records the number of second test failures

(d) ***PB Register***—Records the number of busy circuits passed when APB key is operated or records the number of busy circuits printed by TTY when APB key is normal

(e) ***RST Register***—Records the number of repeat single tests made.

F. Control and Indicator Panel

4.06 Figure 1 provides a typical drawing of the ITT key, jack, and lamp panel. Configuration is controlled by the ITT options selected and will vary between offices.

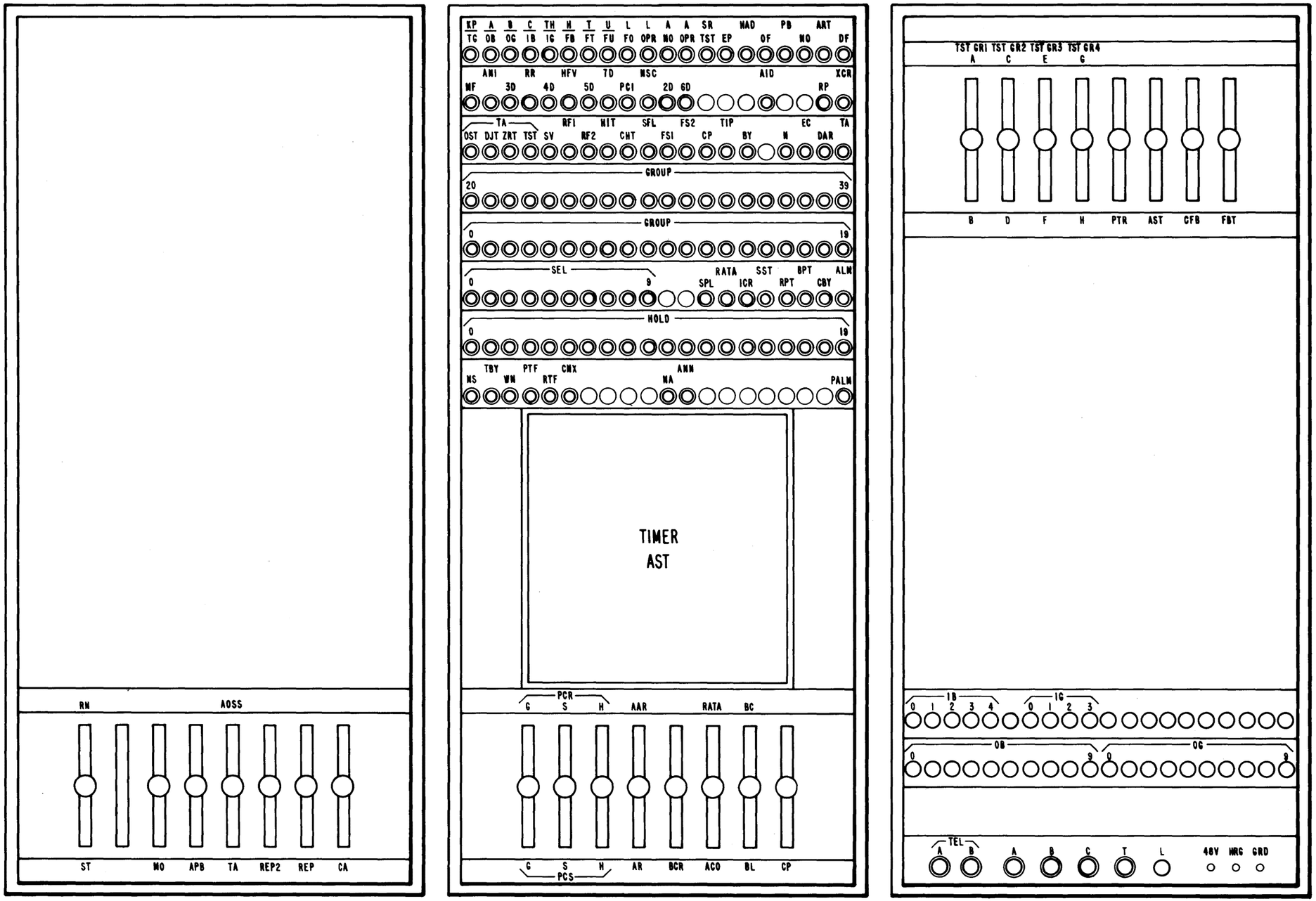
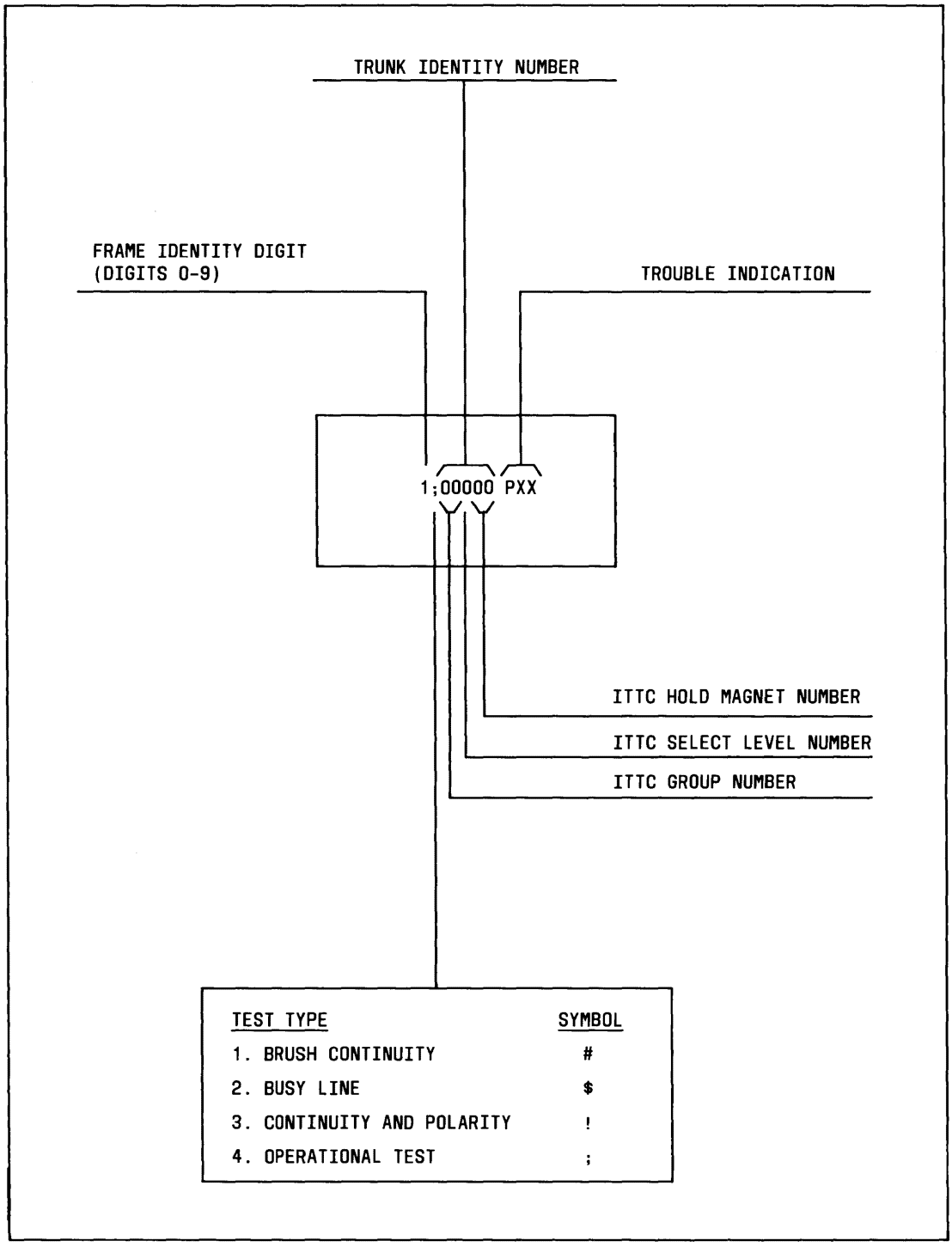


Fig. 1—ITT Key, Jack, and Lamp Panel

TABLE A
TTY OR CSMP PRINTOUT FORMAT



TEST TYPE	SYMBOL
1. BRUSH CONTINUITY	#
2. BUSY LINE	$
3. CONTINUITY AND POLARITY	!
4. OPERATIONAL TEST	;

Table A

TABLE B

TROUBLE PRINTOUT

CHARACTERS PRINTED (See Note)	ASSOCIATED LAMP	GENERAL TROUBLE CATEGORY
AXX	KP, TG CP, OT	Trunk off-normal, no start pulsing signal detected, continuity polarity test failure or office timing
BXX	CBY	ITT connector busy.
DXX	C, IB, TU	Ten thousands digit or incoming brush selection
EXX	TH, IG	Thousands digit or incoming group selection
GXX	H, FB	Hundreds digit or final brush selection
HXX	RTF	Ring trip failure
IXX	T, FT	Ten digit or final tens selection
LXX	U, FU	Units digit or final units selection
NXX	A, OB	A digit or office brush selection, 7 digit pulsing
PXX	EP	Extra pulse detected
QXX	DF	Failure during trunk release, RP trunks
RXX	CHT	Chatter test failure
TXX	B, OG	B digit or office group selection, 7 digit pulsing
VXX	PTF	Pretrip failure of R relay
XAX	A — OPR	A relay operate test
XDX	A — NO	A relay nonoperate test
XEX	L — OPR	L relay operate test
XFX	NS	Noise test failure
XGX	L-FO, AID	L relay nonoperate test or ANI indication
XHX	TBY	All test lines busy
XIX	HIT	False on-hook supervisory flash
XLX	FS1	First on-hook flash too short

TABLE B (Contd)

TROUBLE PRINTOUT

CHARACTERS PRINTED (See Note)	ASSOCIATED LAMP	GENERAL TROUBLE CATEGORY
XOX	FS2	Second on-hook flash too short
XPX	OF	Overflow, reorder, telltale, or voice announcement
XQX	RF1	On-hook signal not returned after first ring forward signal sent
XRX	RF2	On-hook signal not returned after second ring forward signal sent
XXA	HAD	High and dry or vacant terminal tested idle
XXB	BY	Trunk tested busy
XXF	WN	Wrong number checked
XXP	MO	Tip and ring leads momentarily open
XXT	NA	No audible signal detected
XXV	ANN	Voice announcement
XXX	TA	Time-out alarm — undefined trouble

Note: Multiple troubles may be printed. For example, EPX could mean that overflow was received during outpulsing of thousands digit.

TABLE C

ITT KEYS

KEY	POSITION	FUNCTION (WHEN OPERATED)
ACO	ACO	*ALARM CUTOFF:* Prevents operation of general floor alarm circuit (audible alarm); however, TA lamp on ITT will light as an indication of trouble.
AOSS	AOSS	*AUTOMATIC OVERRIDE STUCK SENDER:* Releases ITT if it blocks.
APB	APB	*AUTOMATIC PASS BUSY:* When busy trunks are encountered, ITT scores PB register and advances to next trunk to be tested.
AR — AAR	AR	*AUTOMATIC RETEST:* On PRP (print and repeat) failures, ITT initiates the following action: (1) Printout of type of failure. (2) Scoring of FFT register. (3) Retest of trunk which failed. (4) If trunk fails again, another printout is made, an alarm is sounded, and FST register is scored.
	AAR	*ADVANCE AFTER RETEST:* On PRP (print and repeat) failures, ITT initiates the following action: (1) Printout of type of failure. (2) Scoring of FFT register. (3) Retest of trunk which failed. (4) If trunk fails again, another printout is made and FST register is scored. (5) Advances to next trunk to be tested.
AST	AST	*AUTOMATIC START:* A test cycle will begin or continue automatically when AST timer reaches a preset time. When the automatic start feature is used, the PTR key does not need to be operated to obtain a printout. *Note:* ST key should not be operated at the same time that AST key is operated.
BC — BL	BC	*BRUSH CONTINUITY:* When used in conjunction with IB and IG jack, a continuity check of panel office incoming selector brushes is made on any group desired.
	BL	*BUSY LINE:* Test call is directed to a busy line in a nontoll type office. This provides a rapid exercise test since no current flow check is made of either the ringing or the supervisory relays. The nonoperate check of the incoming trunk A relay can only be performed during the busy line test.
BCR	BCR	*BRUSH CONTINUITY RECYCLE:* Provides a single recycle of brush continuity test if a trunk is found off-normal.
CA	CA	*CONTROLLED ADVANCE:* Advances ITT to next circuit to be tested. If repeat key is operated, a retest is made of same trunk circuit.

TABLE C (Contd)

ITT KEYS

KEY	POSITION	FUNCTION (WHEN OPERATED)
CFB	CFB	*CANCEL FRAME BLOCKAGE:* Provides printout and advance on all failures except wrong numbers.
CP	CP	*CONTINUITY POLARITY:* Provides a rapid test of tip and ring leads to determine if proper continuity and polarity are registered for circuit under test.
FBT	FBT	*FAST BUSY TIMING:* Reduces trunk busy timing from approximately five minutes to approximately one minute.
G	PCR	*GROUP PARTICULAR CIRCUIT RUN:* Advances group selector two positions per second.
	PCS	*GROUP PARTICULAR CIRCUIT STEP:* Advances group selector one position.
H	PCR	*HOLD MAGNET PARTICULAR CIRCUIT RUN:* Advances hold magnet selector two positions per second.
	PCS	*HOLD MAGNET PARTICULAR CIRCUIT STEP:* Advances hold magnet selector one position.
L	L	*LINE MONITOR:* A pushbutton key which permits the trunk circuit under test to be monitored when a receiver is connected to T jack.
MO	MO	*MOMENTARY OPEN:* Provides check on the revertive pulsing trunk circuit tip and ring leads for momentary opens during test of supervisory relay. Trouble is indicated by printout and MO lamp.
PTR	PTR	*PRINT RECORD:* Provides means, in conjunction with TTY control circuit, to receive a printed record of test results. When the automatic start feature is used, the PTR key does not need to be operated to obtain a printout.
RATA	RATA	*REMOTE AUTOMATIC TROUBLE ANALYSIS:* Provides means to record failures at a remote location.
REP	REP	*REPEAT:* Permits continuous repeat tests on same trunk circuit. Each test is scored on a RST register instead of a CT register. *Note:* This key must be operated to use remote control feature.
REP 2	REP 2	*REPEAT 2:* Permits two tests to be made on each trunk circuit before advancing. This feature is useful in detecting slow releasing panel selectors at the time of the retest.

TABLE C (Contd)

ITT KEYS

KEY	POSITION	FUNCTION (WHEN OPERATED)
RN — ST	RN	*RETURN TO NORMAL:* Returns ITT connector to normal.
	ST	*START TEST:* Provides test frame with a manual start. *Note:* Do not operate while AST key is operated.
S	PCR	*SELECT MAGNET PARTICULAR CIRCUIT RUN:* Advances select magnet selector two positions per second.
	PCS	*SELECT MAGNET PARTICULAR CIRCUIT STEP:* Advances select magnet selector one position.
TA	TA	*TIME ALARM:* Cancels busy and trouble timing and prevents the test frame from advancing progressively to other trunk circuits.
TST-GR	ALL Positions	This key provides the capability of dividing trunk circuits into two test groups. *Note:* Key not provided if trunk circuits divided into eight test groups.
	A	*TEST GROUP A:* Selects trunks for test appearing in group A and excludes trunks appearing in group B.
	B	*TEST GROUP B:* Selects trunks for test appearing in group B and excludes trunks appearing in group A.
	A & B	*TEST GROUPS A & B:* Selects trunks for test appearing in both groups A and B.
TST GR (1 — 4)	ALL Positions	These keys provide the capability of dividing trunk circuits into eight test groups. *Note:* Keys not provided if trunk circuits divided into two test groups.
	A & B C & D E & F G & H	*TEST GROUPS A & B, C & D, E & F, AND G & H:* Selects trunks for test appearing in group A, B, C, D, E, F, G, and H.
TST GR1	A	*TEST GROUP A:* Selects trunks for test appearing in group A and excludes trunks appearing in group B.
	B	*TEST GROUP B:* Selects trunks for test appearing in group B and excludes trunks appearing in group A.
	A or B	Also excludes those test groups which meet the following conditions: (1) Groups C and D when TST GR2 key in position C & D. (2) Groups E and F when TST GR3 key in position E & F. (3) Groups G and H when TST GR4 key in position G & H.

TABLE C (Contd)

ITT KEYS

KEY	POSITION	FUNCTION (WHEN OPERATED)
TST GR2	C	*TEST GROUP C:* Selects trunks for test appearing in group C and excludes trunks appearing in group D.
	D	*TEST GROUP D:* Selects trunks for test appearing in group D and excludes trunks appearing in group C.
	C or D	Also excludes those test groups which meet the following conditions: (1) Groups A and B when TST GR1 key in position A & B. (2) Groups E and F when TST GR3 key in position E & F. (3) Groups G and H when TST GR4 key in position G & H.
TST GR3	E	*TEST GROUP E:* Selects trunks for test appearing in group E and excludes trunks appearing in group F.
	F	*TEST GROUP F:* Selects trunks for test appearing in group F and excludes trunks appearing in group E.
	E or F	Also excludes those test groups which meet the following conditions: (1) Groups A and B when TST GR1 key in position A & B. (2) Groups C and D when TST GR2 key in position C & D. (3) Groups G and H when TST GR4 key in position G & H.
TST GR4	G	*TEST GROUP G:* Selects trunks for test appearing in group G and excludes trunks appearing in group F.
	H	*TEST GROUP H:* Selects trunks for test appearing in group H and excludes trunks appearing in group G.
	G or H	Also excludes those test groups which meet the following conditions: (1) Group A and B when TST GR1 key in position A & B. (2) Group C and D when TST GR2 key in position C & D. (3) Group E and F when TST GR3 key in position E & F.

TABLE D

JACKS

JACK	FUNCTION
A	Provides ground on the sleeve and 48-volt battery on the tip to inserted test set cord.
B	A miscellaneous jack which multiples to other B jacks.
C	Provides remote control advance of test frame when used with 32A test set.
IB (0—4)	Provides for selection of desired brush for incoming selector brush continuity test.
IG (0—3)	Provides for selection of desired group for incoming selector brush continuity test.
OB (0—9)	Provides for selection of desired brush for office selector brush continuity test.
OG (0—9)	Provides for selection of desired group for office selector brush continuity test.
T	Used to monitor test tone indications with receiver when L key is operated.
TEL	Provides connection between two or more frames when headset is inserted. Talking battery is supplied through the connecting circuit.

TABLE E

ITT LAMPS

LAMP	TYPE *	ASSOCIATED CHARACTERS	SIGNIFICANCE
2D	C	—	*2-DIGIT PULSING:* Indicates 2-digit revertive pulsing
3D	C	—	*3-DIGIT PULSING:* Indicates 3-digit outpulsing to test line which is not arranged to receive a ring forward (rering) signal.
4D	C	—	*4-DIGIT PULSING:* Indicates the requirement for 4-digit outpulsing to test line.
5D	C	—	*5-DIGIT PULSING:* Indicates the requirement for 5-digit outpulsing to test line.
6D	C	—	*6-DIGIT PULSING:* Indicates the requirement for 6-digit outpulsing to test line.
7D	C	—	*7-DIGIT PULSING:* Indicates the requirement for 7-digit outpulsing to test line.
A	P	—	*A-DIGIT OUTPULSED:* Indicates first digit of a 7-digit call is being outpulsed.
AID	P	NXX	*ANI INDICATION:* Indicates automatic number identification in progress. Calling number identification is completed when lamp is extinguished.
ALM	T		*ALARM:* Indicates floor alarm is activated.
ANI	C	—	*AUTOMATIC NUMBER IDENTIFICATION:* Indicates the requirement of ANI feature. Called number may be outpulsed either MF or PCI, but calling number is always outpulsed MF.
A — NO	P	XDX	*A RELAY NONOPERATE:* Indicates the application of a nonoperate test of the incoming trunk circuit A relay. This test only performed on Busy Line Test.
A — OPR	P	XAX	*A RELAY OPERATE:* Indicates the application of an operate test of the incoming trunk circuit A relay.
ANN	T	XXV	*ANNOUNCEMENT:* Test call has reached a voice announcement.
ART	P	—	*AUTOMATIC REPEAT TEST:* Indicates repeat test in progress. Requires operation of the REP-2 key to function.

* C = CLASS P = PROGRESS I = INFORMATION T = TROUBLE

TABLE E (Contd)

ITT LAMPS

LAMP	TYPE *	ASSOCIATED CHARACTERS	SIGNIFICANCE
B	P	TXX	*B-DIGIT OUTPULSED:* Indicates second digit of a 7-digit call is being outpulsed.
BPT	I	—	*BALANCE PORT TEST:* Indicates remote office test line has access to balance port.
BY	P	XXB	*BUSY TRUNK:* Indicates ITT has encountered a busy trunk.
C	P	DXX	*C-DIGIT OUTPULSED:* Indicates third digit of a 7-digit call or first digit of a 5-digit call is being outpulsed.
CBY	I	BXX	*CONNECTOR BUSY:* Indicates ITT connector is busy.
CHT	T	RXX	*CHATTER TEST FAILURE:* Indicates that supervision from the test line has changed from off-hook to on-hook and back again to off-hook during a 2-second timing interval.
CNX	P	—	*CENTREX TEST:* Indicates the application of the transfer test feature on centrex trunk circuit under test.
CP	P	AXX	*CONTINUITY POLARITY TEST:* Indicates ITT is checking the continuity and polarity of tip and ring leads of trunk under test.
DAR	T	—	*DISCONNECT AFTER RINGING:* Indicates that far end has disconnected upon receipt of ringing signal.
DF	T	QXX	*DISCONNECT FAILURE:* Indicates that revertive pulsing trunk under test has failed to release properly and that trunk is still in the off-normal condition.
EC	P	—	*END OF CYCLE:* Indicates ITT has completed a test cycle. A minor audible alarm is also sounded.
EP	T	PXX	*EXTRA PULSE:* Indicates detection of additional pulses on calls directed to synchronous test lines.
FB	P	GXX	*FINAL BRUSH SELECTION:* Indicates ITT is in the process of making final brush selection.
FS1	T	XLX	*FIRST FLASH SHORT:* Indicates that first supervisory flash was too short.
FS2	T	XOX	*SECOND FLASH SHORT:* Indicates that second supervisory flash was too short.

* C = CLASS; P = PROGRESS; I = INFORMATION; T = TROUBLE

TABLE E (Contd)

ITT LAMPS

LAMP	TYPE *	ASSOCIATED CHARACTERS	SIGNIFICANCE
FT	P	IXX	*FINAL TENS SELECTION:* Indicates ITT is in the process of making final tens selection.
FU	P	LXX	*FINAL UNITS SELECTION:* Indicates ITT is in the process of making final units selection.
GROUP (0—39)	I	#	*GROUP NUMBER:* Indicates selected ITT connector number. Used in conjunction with SEL (0—9) and HOLD (0—19) lamps to form the trunk identity number. # The ten thousands and thousands digits of the TTY five digit trunk identity number.
H	P	GXX	*HUNDREDS DIGIT OUTPULSED:* Indicates hundreds digit is being outpulsed.
HAD	T	XXA	*HIGH AND DRY:* Indicates no off-hook or tone signals received. On continuity and polarity test, it indicates that a vacant terminal did not test busy.
HFV	C	—	*HIGH FIVE:* High five incoming group.
HIT	T	XIX	*HIT FAILURE:* Indicates a premature trunk reversal from the off-hook to the on-hook condition.
HOLD (0—19)	I	#	*HOLD MAGNET NUMBER:* Indicates selected ITT connector hold magnet number. Used in conjunction with GROUP (0—39) and SEL (0—9) lamps to form the trunk identity number. # The tens and units digits of the TTY five digit trunk identity number.
IB	P	DXX	*INCOMING BRUSH SELECTION:* Indicates ITT is in the process of making incoming brush selection.
ICR	T	—	*ITT CONNECTOR RELEASE:* Indicates a trouble condition detected by the ITT has been released to allow another circuit to use the connector.
IG	P	EXX	*INCOMING GROUP SELECTION:* Indicates ITT is in the process of making incoming group selection.
KP	P	AXX	*KEYPULSE DIGIT:* Indicates the keypulse digit is being outpulsed.

* C = CLASS; P = PROGRESS; I = INFORMATION; T = TROUBLE

TABLE E (Contd)

ITT LAMPS

LAMP	TYPE *	ASSOCIATED CHARACTERS	SIGNIFICANCE
L — FO	P	XGX	*L RELAY FALSE OPERATE:* Indicates the application of a nonoperate (false operate) test of the incoming trunk L relay. *Note:* Only used on revertive pulsing trunks to panel incoming selectors.
L — OPR	P	XEX	*L RELAY OPERATE:* Indicates the application of an operate test of the incoming trunk L relay. *Note:* Only used on revertive pulsing trunks to panel incoming selectors.
MF	C	—	*MULTIFREQUENCY PULSING:* Indicates that trunk under test requires multifrequency pulsing.
MO	T	XXP	*MOMENTARY OPEN:* Indicates ITT detected a momentary open on the revertive pulsing trunk circuit tip and ring leads during test of supervisory relay.
N	I	—	*NORMAL:* Indicates test frame has returned to normal.
NA	T	XXT	*NO AUDIBLE:* Indicates ITT failed to detect an audible signal.
NS	T	XFX	*NOISE FAILURE:* Indicates that during noise check, tone detector circuit encountered an uninterrupted tone (over —30DB signal) for longer than 6 seconds in duration.
NSC	C	—	*NONSTANDARD CODE:* Indicates use of a nonstandard test code.
OB	P	NXX	*OFFICE BRUSH SELECTION:* Indicates ITT is in the process of making office brush selection.
OF	T	XPX	*OVERFLOW:* Indicates ITT has encountered one of the following conditions: overflow, reorder, telltale, or announcement.
OG	P	TXX	*OFFICE GROUP SELECTION:* Indicates ITT is in the process of making office group selection.
OI (0—9)	C	—	*OFFICE INDICATION DIGIT:* Indicates requirement for 5-digit outpulsing to test line. For ANI trunks, OI (0 or 1) indicates the selection of the ANI x-digit.
PALM	T		*PRINTER ALARM:* Indicates message printer not functional.

* C = CLASS; P = PROGRESS; I = INFORMATION; T = TROUBLE

TABLE E (Contd)

ITT LAMPS

LAMP	TYPE *	ASSOCIATED CHARACTERS	SIGNIFICANCE
PB	T	—	*PATHS BUSY:* Indicates ITT encountered all revertive pulsing test lines busy. For crossbar offices only: indicates ITT encountered all channels busy during A relay operate test.
PCI	C	—	*PANEL CALL INDICATOR PULSING:* Indicates that trunk under test requires PCI pulsing.
PS	P	—	*PULSING SENT:* Indicates that outpulsing is completed.
PTF	T	VXX	*PRETRIP FAILURE:* Indicates false operation of incoming trunk R relay during pretrip test.
RA	P	—	*RECORDER-TICKETER ATTACHED:* Indicates ITT is connected to the recorder ticketer.
RATA	I	—	*REMOTE AUTOMATIC TROUBLE ANALYSIS:* Trouble failures are recorded at remote location.
RP	C	—	*REVERTIVE PULSING:* Indicates type of trunk.
RR	C	—	*RERING:* Indicates a 3-digit, nonstandard, test code.
RF1	P	XQX	*FIRST RING FORWARD:* Indicates that first ring forward signal was transmitted to a rering test line.
RF2	P	XRX	*SECOND RING FORWARD:* Indicates that second ring forward signal was transmitted to a rering test line.
RPT	I	—	*ROTL PORT TEST:* Indicates remote office test line has access to ROTL port.
RTF	T	HXX	*RING TRIP FAILURE:* Indicates operate test failure of incoming trunk R relay.
SEL (0—9)	I	#	*SELECT LEVEL NUMBER:* Indicates selected ITT connector select level number. Used in conjunction with GROUP (0—39) and HOLD (0—19) lamps to form the trunk identity number. # The hundreds digit of the TTY five digit trunk identity number.
SFL	T	OXX	*SUPERVISORY FLASH FAILURE:* Indicates that supervisory flash failed to synchronize.

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TABLE E (Contd)

ITT LAMPS

LAMP	TYPE *	ASSOCIATED CHARACTERS	SIGNIFICANCE
SPL	C	—	*SPECIAL CLASS — PTCC:* Cross-connectable. Indication is user defined.
SR — TST	P	—	*SUPERVISORY TEST:* Indicates that outpulsing is completed and that incoming trunk has reserved a test line for making ringing and supervisory tests.
SV	P	—	*SUPERVISION REPEATED:* Indicates test progress tone or on-hook signal is present.
T	P	IXX	*TENS DIGIT OUTPULSED:* Indicates tens digit is being outpulsed.
TA	T	XXX	*TIME ALARM:* Indicates ITT has timed out and is associated with an audible alarm circuit.
TA — —	T	—	*TIME ALARM — OTHER TEST FRAMES:* Each lamp is multipled to TA lamp of other test frame and indicates other test frame has timed out as follows: OST — Originating sender test frame DJT — District junctor test frame ZRT — Zone registration test frame TST — Terminating sender test frame
TBY	T	XHX	*TONE BUSY:* Indicates ITT encountered all test lines busy.
TG	P	AXX	*TRUNK GUARD TEST:* Indicates the application of trunk guard test to determine that selected trunk tip and ring leads are continuous to battery and ground and not reversed.
TH	P	EXX	*THOUSANDS DIGIT OUTPULSED:* Indicates thousands digit is being outpulsed.
TIP	T	—	*TIMER IN PROGRESS:* Indicates that automatic start timer is off-normal.
TU	P	DXX	*TERMINATING UNIT:* Indicates that first digit of a 5-digit call is being outpulsed.
U	P	LXX	*UNITS DIGIT OUTPULSED:* Indicate units digit is being outpulsed.
WN	T	XXF	*WRONG NUMBER:* Indicates that tone detector circuit has encountered a wrong number. The test frame always blocks and activates alarm circuit.
XCR	T	—	*CROSSED CODE RELAYS:* Indicates attempt to print two different TTY characters in the same position. The test frame always blocks and activates alarm circuit.

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