

**COMMON CHANNEL INTEROFFICE SIGNALING
CONTINUITY CHECK TRANSCEIVER
AND LOOP-AROUND TEST UNIT
J4A010AE-1
DESCRIPTION AND THEORY
NO. 4 ELECTRONIC SWITCHING SYSTEM**

CONTENTS	PAGE	CONTENTS	PAGE
1. GENERAL	2	5. POWER AND ALARM CIRCUITS	6
INTRODUCTION	2	INTRODUCTION	6
PURPOSE OF CCIS CONTINUITY CHECK TRANSCEIVER	2	POWER REQUIREMENTS	6
PURPOSE OF LOOP-AROUND TEST CIRCUIT	3	POWER CONTROL AND ALARM CIRCUITS	6
EQUIPMENT CHARACTERISTICS	3	6. MAINTENANCE	7
2. PHYSICAL DESCRIPTION	3	INTRODUCTION	7
CCIS CONTINUITY CHECK TRANSCEIVER AND LOOP-AROUND TEST UNIT—J4A010AE-1	3	MAINTENANCE SOFTWARE	7
3. FUNCTIONAL INTERFACE	4	MAINTENANCE AIDS	7
4. FUNCTIONAL DESCRIPTION AND THEORY	4	ROUTINE TASKS	8
CONTINUITY CHECK TRANSCEIVER—FUNC- TIONAL OPERATION	4	REPAIR OR REPLACE TASKS	8
CONTINUITY CHECK TRANSCEIVER—SIGNAL AND CONTROL CIRCUITS	4	7. REFERENCES	8
LOOP-AROUND TEST CIRCUIT—FUNCTIONAL OPERATION	5	Figures	
LOOP-AROUND TEST CIRCUIT—SIGNAL AND CONTROL CIRCUITS	5	1. CCIS CCT & LAT Unit J4A010AE-1—Equipment Identification	8
		2. CCIS CCT & LAT Unit—Functional Interface Block Diagram	9
		3. Interconnections—CCT 4-Wire Voice Frequency Lines	9

AT&T CUSTOMER INFORMATION CENTER
 Quality Engineering Organization
 ARCHIVE STATUS: DOCUMENT
 Signed: *[Signature]* Date: *3-41*

NOTICE

This document is either
AT&T - Proprietary, or WESTERN
ELECTRIC - Proprietary

Pursuant to Judge Greene's Order of August 5, 1983,
beginning on January 1, 1984, AT&T will cease to use
"Bell" and the Bell symbol, with the exceptions as set
forth in that Order. Pursuant thereto, any reference to
"BELL" and/or the BELL symbol in this document is here-
by deleted and "expunged".

CONTENTS	PAGE
4. Interconnections—LAT Circuit 4-Wire Voice Frequency Lines	10
5. CCIS Continuity Check Transceiver—Functional Block Diagram	11
6. CCIS LAT Circuit—Functional Block Diagram	12
7. CCIS CCT & LAT Unit—Power and Alarm Circuits	13
 Tables	
A. Abbreviations and Acronyms	14
B. CCIS Continuity Check Transceiver Operating Modes	15

1. GENERAL

INTRODUCTION

1.01 This section provides information for telephone company personnel to attain a better understanding of how the common channel interoffice signaling (CCIS) continuity check transceiver (CCT) and loop-around test (LAT) unit operates. The following information is included in this section:

- Purpose of the CCT
- Purpose of the LAT circuit
- Physical description of the CCIS CCT & LAT unit
- Description of the CCIS CCT & LAT unit functional interface with the No. 4 Electronic Switching System (ESS)
- A functional description and theory of operation of the CCT
- A functional description and theory of operation of the LAT circuit
- Power and alarm circuit operation
- Maintenance philosophy.

Table A provides a list of all abbreviations and acronyms with applicable terms used in this section.

1.02 ♦This section is reissued for the following reasons.

- Update text and illustrations to reflect interfaces with the D4 channel bank in addition to the voiceband interface frame
- Clarify use of certain acronyms
- Generally update section♦

1.03 ♦This issue of the section is based on the following schematic drawings:

SD-4A025-01, Issue 4A, LDI 4B

SD-4A081-01, Issue 1 LDI 1B

If this section is to be used with equipment or apparatus reflecting later issue of the schematic drawing, reference should be made to the schematic drawing and circuit description to determine the extent of the changes and the manner in which the section may be affected.♦

PURPOSE OF CCIS CONTINUITY CHECK TRANSCEIVER

1.04 Signaling is transmitted over the talking path of non-CCIS trunks to provide address and supervisory signals as well as a per call trunk test prior to completing the connection for each call. Since signaling is not transmitted over the talking path of CCIS trunks, a voice path assurance test is required before each 2- or 4-wire CCIS trunk is used to insure that defective trunks are not utilized. The CCIS CCT described in this section is utilized in each No. 4 ESS office to perform this function. The check consists of transmitting a tone on a trunk from the originating office and detecting that tone on the return path in the case of a 4-wire looped trunk, or detecting a translated response tone in the case of a 2-wire trunk. When the received tone is detected and found to exceed a previously established level and the tone subsequently is detected as having been removed, the continuity check is considered successful. A voice path assurance test is performed on each trunk during call processing routines for each CCIS call. The No. 4 ESS CCIS CCT is also utilized as a transponder to enable a connecting office to

perform voice path assurance tests on 2-wire CCIS trunks incoming to the No. 4 ESS office.

PURPOSE OF LOOP-AROUND TEST CIRCUIT

1.05 The LAT circuit provides the capability to loop a 4-wire No. 4 ESS network port on itself through variable gain or loss, and to generate and measure tones at variable levels and frequencies as required to test CCIS CCT circuits. Each LAT circuit interfaces with the No. 4 switching network via a single input/output port on the voiceband interface or D4 channel bank. This arrangement provides a LAT circuit which may be operated and switched under program control for routine and/or maintenance testing of CCIS CCTs, loop-back tests for CCIS MODEMs in CCIS terminal groups, and for use as a loop-around circuit wherever a loop-around with loss or gain is required.

1.06 The CCIS CCT & LAT unit provides the following.

- Means for housing eight CCT circuit packs and two LAT circuit packs (Fig. 1).
- Connectors necessary to wire the circuit packs into the office. These connectors provide access to signal processor scan and signal distributor (SD) points, and to voiceband interface frame or D4 channel bank transmission points.
- A power converter and associated power switch to power the circuit packs and provide power control and alarm circuitry.

EQUIPMENT CHARACTERISTICS

1.07 The CCT & LAT unit is designed to operate on a supply voltage between 20.75 and 26.25 volts dc at an ambient temperature range of 0 to 50°C. A single 4-wire balanced 600-ohm appearance on the No. 4 switching network is provided for each of the eight CCTs and for each of the two LAT circuits. The CCT is designed to generate a signal level of -15 ± 0.5 dBm when measured at the -3 dB transmission level point. The LAT circuit oscillator output level is frequency dependent (-15.3 dB to -14.0 dB). Compensation for output level variations is accomplished by program control of the loss/gain part of the circuit. The signal frequency of each CCT and each LAT circuit is

selectable under program control, as described later in this section.

1.08 The LAT circuit is designed to indicate a pass condition (scan point closure) on a 2010 Hz signal with an input level of -15 ± 1.25 dBm, or greater. An adjustable attenuator in both the input and output circuits provide fixed losses to compensate for the variations due to wiring loss and voiceband interface frame or D4 channel bank low-pass filters. With zero loss/gain inserted in the LAT circuit, the adjustable attenuators are set for a fixed loss as follows.

- The input attenuator is set for a loss of 0.5 ± 0.1 dB between the voiceband interface frame or D4 channel bank input appearance and the level measuring part of the test circuit.
- The output attenuator is set for a total loop loss of 1.0 ± 0.1 dB, including the loss through all wiring and both voiceband interface frame or D4 channel bank input and output appearances on the No. 4 switching network.

1.09 The design of the CCIS CCT & LAT unit is based on 1A technology which is described in Section 254-200-001. This technology makes extensive use of integrated circuits, modular construction, and machine-aided wiring.

2. PHYSICAL DESCRIPTION

CCIS CCT AND LOOP-AROUND TEST UNIT—J4A010AE-1

2.01 The CCIS CCT and loop-around test unit (Fig. 1) is a 4-inch high assembly which mounts in the 2-foot 2-inch wide miscellaneous frame A. The miscellaneous frame A is equipped with two J4A010AE-1 CCIS CCT & LAT units, mounted between frame equipment locations 46 and 54. Each J4A010AE-1 unit is equipped with eight CCT plug-in circuit packs, two LAT plug-in circuit packs, a +5V dc-dc converter, a power switch, and three relays. The power switch and three relays provide manual and automatic shutoff of the +24V power to the plug-in circuit packs and +5V dc-dc converter. It also provides manual power alarm test features and an office alarm signal. Refer to Section 254-200-001 for identification and function of the KS-20738, L4 power switch controls and indicators. The J-87389S +5V dc-dc converter is equipped with a red alarm indicator

which, when lighted, indicates a converter power alarm.

2.02 The number of CCIS CCTs required in an office to adequately service the maximum expected CCIS call attempts is traffic engineered. Miscellaneous frame A equipment lists provide for a maximum of two J4A010AC-1 CCIS CCT units in addition to the two J4A010AE-1 CCIS CCT & LAT units. Each J4A010AC-1 unit may be equipped with 12 CCTs in increments of six. Maximum miscellaneous frame A equipment provides a total of 40 CCTs and four LAT circuits. Future requirements for CCTs are not currently specified. The J4A010AC-1 CCIS CCT unit is described in Section 234-110-104.

3. FUNCTIONAL INTERFACE

3.01 Figure 2 illustrates the CCIS CCT & LAT unit functional interface with the No. 4 ESS. The input and output signal path for each of the functional plug-in circuits terminates at the voiceband interface frame or D4 channel bank via a terminal strip in the multifrequency (MF) signaling frame. The input and output signal paths are illustrated in Figures 3 and 4. As specified in note 30-2 of SD-4A081-01, these leads are distributed between two voiceband interface frames or D4 channel banks for reliability. Thus, the signal leads of each CCT and each LAT circuit may be switched under program control for connection with any other No. 4 ESS switching network appearances. Functional operation of each CCT and each LAT circuit is accomplished under program control via dedicated scan and SD points connected between the signal processor and each functional circuit. These interfaces (Fig. 2) consist of four SD points and one scan point for each CCT circuit; and ten SD points and one scan point for each LAT circuit.

3.02 Two scan points and two SD points connect the CCIS CCT & LAT unit power and alarm circuit to the signal processor. The two scan points indicate request out-of-service (ROS) and power status and alarms to the signal processor. The two SD points directly control the out-of-service (OS) lamp and the acknowledge (ACK) lamp located on the power switch. The power switch is also connected to the office alarm system to signal a major office alarm in the event of an alarmed power down condition.

4. FUNCTIONAL DESCRIPTION AND THEORY

CONTINUITY CHECK TRANSCEIVER—FUNCTIONAL OPERATION

4.01 Each CCIS voice path trunk link between two switching offices is tested for continuity and acceptability prior to its use as a talking path. In general, the continuity check is made on a trunk between two switching offices, one link at a time, as the call processing progresses. The typical test consists of the originating office sending a tone out on the trunk, which in the 4-wire case is then looped back at the receiving office. Successful reception of the tone back at the sending office and the subsequent detection of the tone having been removed constitutes the completion of the test. In the case of 2-wire trunks, two tones are used. One tone is sent at the transmitting end and a transponder at the receiving office sends the other tone back upon receipt of the first tone. Therefore, there are four basic functional modes of CCIS continuity checking:

- 2-wire—originating test
- 2-wire—looping (transponding)
- 4-wire—originating test
- 4-wire—looping (idle mode)

Two-wire trunks always require two test frequencies. The No. 4 ESS is equipped to perform these four functions. The 4-wire looping is performed directly in the No. 4 ESS switching network while the CCIS CCT is utilized to perform the other three functions.

CONTINUITY CHECK TRANSCEIVER—SIGNAL AND CONTROL CIRCUITS

4.02 The CCIS CCT (Fig. 5) consists of a single FB-607 circuit pack. The transmitter section consists of a 2-frequency oscillator, digital gating, and an active filter output circuit. Tones are generated as square waves for stability and ease of gating, and are then passed through the active filter which selects the sine wave fundamental. The T and R output leads form a balanced 600 ohm output for the switched -15 dBm 1780 Hz or 2010 Hz sine wave signal used to test the continuity and signal loss of a No. 4 ESS trunk.

4.03 The receiver section consists of an active filter, a peak detector, a scaling comparator, and a timing circuit. The active filter has a very narrow bandpass centered at 2010 Hz. The 2010 Hz input signal is then peak detected and fed to the scaling comparator. The settings of the level 1 and level 2 SD points determine at which of four input levels the comparator will switch. Output from the comparator then goes to the timing circuit. In the transceiving mode (2-wire or 4-wire originating test), the timing circuit turns off the transmitter output signal and operates a scan point if the test is successful. In the transponding mode (2-wire looping), the timing circuit is inoperative and serves only to gate out the transmitter signal while the incoming 2010 Hz tone remains above the comparator acceptance level. (Note that either one of two frequencies may be transmitted and only 2010 Hz may be received in a No. 4 ESS office. Therefore, the transceiver in a 2-wire office must have the capability of receiving 1780 Hz).

4.04 The CCIS CCT is connected via the No. 4 ESS switching network to the trunk to be tested. The four operating modes of this circuit (Table B) are determined by two SD points from the signal processor: start and frequency. The start SD point determines whether the circuit is in the transponding or transceiving mode. The frequency SD point sets the output frequency to 1780 Hz or 2010 Hz. When frequency is open, the transmit frequency is 2010 Hz; when frequency is closed, the transmit frequency is 1780 Hz. The transponding mode is passive, where the reception of a 2010 Hz signal, which meets the comparator threshold level established by SD points level 1 and level 2, gates out the transmitter 2010 Hz or 1780 Hz signal to the originating office. Since the 2010 Hz transponding function is performed by the No. 4 ESS switching network, this operating mode of the CCT is used as the idle state.

4.05 When the No. 4 ESS is initiating the continuity check (2-wire or 4-wire originating test), the start SD point is closed. A 2010 Hz or 1780 Hz tone (depending on the state of the frequency SD point) appears on the T and R output leads. Returning 2010 Hz tone appears at the input of the receiver some time later, depending on the length of the trunk under test. Thirty milliseconds after the comparator switches, indicating that the received tone is correct, the receiver timer starts a 40 ms timer and also lowers the comparator acceptance level by 6 dB. After the 40 ms, the transmitted tone is turned off. When the returning

2010 Hz tone falls below the comparator threshold level, the receiver timer initiates a 15 ms delay, after which the report scan point is set. This action indicates a successful test to the signal processor and constitutes a trunk test for both continuity and level.

LOOP-AROUND TEST CIRCUIT—FUNCTIONAL OPERATION

4.06 The LAT circuit is operated and monitored by ten SD points and one scan point, respectively. The SD points are controlled by maintenance and/or diagnostic programs resident in the 1A Processor. Demand testing may be implemented via teletypewriter input message. The LAT circuit may be utilized as a loop-around circuit with variable loss or gain, a signal generator with selectable frequency and output level, or as a programmable level measuring circuit at a frequency of 2010 Hz. The input and output of each LAT circuit terminates on a single 4-wire voiceband interface frame or ♦D4 channel bank♦ port, thereby providing program controlled connection through the No. 4 ESS switching network with any other voiceband interface frame or ♦D4 channel bank♦ appearance. The LAT circuit is primarily designed to test the operation of CCIS CCTs and also to serve as a loop-around circuit required in the external loop-back test for CCIS MODEMs in the No. 4 ESS CCIS terminal group. In general, this circuit may be used wherever a loop-around circuit with loss or gain is required.

4.07 When used to test CCIS CCT operation, the input and output signal leads of the CCT under test are connected via the No. 4 ESS switching network with the signal leads of the LAT circuit. The test circuit is operated in the 2010 Hz level measuring mode with the appropriate attenuation selected. Closure of the test circuit scan point indicates an acceptable 2010 Hz signal level from the CCT under test. The test circuit is then utilized to generate four frequencies (one at a time) about 2010 Hz to test the frequency characteristics of the receiver portion of the CCT under test. The test circuit oscillator frequency and output level selection are under program control. Proper CCT operation is indicated via the scan point from the CCT under test.

LOOP-AROUND TEST CIRCUIT—SIGNAL AND CONTROL CIRCUITS

4.08 Each CCIS LAT circuit (Fig. 6) is contained on a plug-in circuit pack (FB606). One

input attenuator and one output attenuator are provided to manually pad out the variations due to wiring loss and loss through the voiceband interface unit low-pass filters. The gain or loss of the test circuit amplifier/attenuator section is controlled by the six GAIN/ATTENUATION SD points. The states (opened or closed) of these six SD points provide a signal gain or loss range from +16 dB to -15.5 dB, adjustable in 0.5 dB increments. The output of the amplifier/attenuator section goes to the 2010 Hz level detector; and to the test circuit output attenuator when enabled by the OUT GATE SD point. The level detector includes a bandpass filter centered at a frequency of 2010 Hz. The level detector REPORT scan point closes when the input signal to the level detector exceeds -27 ± 0.5 dBm at a frequency of 2010 ± 30 Hz.

4.09 A transfer function is provided to select either the test circuit oscillator (OSC) signal or the signal from the voiceband interface frame or D4 channel bank. This function is controlled via the OSC/LOOP SD point which gates the selected signal to the amplifier/attenuator section. The frequency of the test circuit oscillator is selected via the frequency-1 and frequency-2 SD points. These SD points are provided to check the receive section of a CCT under test. The states of these two SD points (opened or closed) provide a signal at the oscillator output at a frequency of 1830 Hz, 1980 Hz, 2040 Hz, or 2190 Hz, with respective levels of -14.5 dB, -14.0 dB, -14.1 dB and -15.3 dB. The variations of oscillator output level with frequency is compensated for by program control of the amplifier/attenuator section. The CCT should fail to detect a signal at 1830 Hz or 2190 Hz and successfully detect a signal at 1980 Hz or 2040 Hz.

5. POWER AND ALARM CIRCUITS

INTRODUCTION

5.01 This part includes discussion of the following:

- Power input to the CCT & LAT Unit
- Power distribution within the CCT & LAT Unit
- Power control
- Alarm circuits.

Figure 7 is a functional block diagram of the CCT & LAT unit power and alarm circuits.

POWER REQUIREMENTS

5.02 The single +24 volt power input, required by each CCIS CCT & LAT unit, is distributed from the miscellaneous frame A fuse panel via fuse MB or MD. For reliability the fuses MB and MD are powered by separate power inputs. The two CCIS CCT & LAT units within miscellaneous frame A will not receive power input from the same fuse, if CCIS CCT & LAT unit zero receives power from fuse MB, CCIS CCT & LAT unit one will receive power from fuse MD, and vice versa. The +24V input voltage supply to a CCIS CCT & LAT unit operates the +5V dc-dc converter, the power switch control circuits and lamps, and to provide switched +24 volts (+24V START) to the +5V dc-dc converter and each functional circuit pack. In addition to the +5 volts supplied by the +5V dc-dc converter, each functional circuit pack derives +24, +12, and +7 operating reference voltages from the switched +24V.

POWER CONTROL AND ALARM CIRCUITS

5.03 The circuits that control CCT & LAT unit power are:

- Unit power switch and associated relay circuits
- Output monitor and reference circuit internal to the +5V dc-dc converter
- Miscellaneous frame A fuse MC or MD.

These circuits operate in conjunction with each other to provide manual and automatic control of unit power, power alarm test, power status and alarm signals to the signal processor and a major alarm signal to the office alarm system. Each CCT & LAT unit can be powered up only manually by operation of the power switch ON pushbutton, but it can be powered down both manually, by operation of the power switch OFF pushbutton (normal power down), or automatically when an alarmed power condition occurs (alarmed condition power down).

5.04 All fuses in the miscellaneous frame A contain an alarm contact that closes upon fuse failure to operate the frame alarm circuits. The failure

of fuse MC or MD will result in a major alarm to the office alarm system and removal of the supply voltage to the associated CCT & LAT unit.

5.05 The CCT & LAT unit +5V dc-dc converter contains circuitry which monitors the +5V output for an out-of-range voltage (OORV), overcurrent (OC), or overvoltage (OV) condition. This circuitry acts as an electronic fuse for the converter during an OC or OV condition. Except during a power alarm test, an OORV, OC, or OV condition of the converter will initiate an automatic power down condition of the CCT & LAT unit. In the alarmed condition, power down status is reported to the signal processor via the two power switch scan points (scan point code 1, 1), and a major alarm is signaled to the office alarm system.

5.06 A manual power alarm test may be performed to test the +5V dc-dc converter OORV output monitor for correct operation. The power alarm test is started by rotating the power switch OFF pushbutton to the ROS position. This action changes the scan point code to 1, 0 (request out-of-service). After the OS lamp is lighted by the signal processor, the TEST pushbutton is depressed for at least 0.5 seconds to initiate the power alarm test and disable the converter fuse alarm (CFA) relay. A properly functioning converter senses a power alarm condition and lights its alarm indicator. Test results are verified by observing that the alarm indicator is lighted. Test restoral is accomplished by returning the OFF pushbutton to the normal position and momentarily depressing the ON pushbutton. This action signals a nonpower alarm to the converter to reset the alarm indicator. Test restoral is verified by observing that the converter alarm indicator is extinguished and the power switch lamps are in the normal power on state.

6. MAINTENANCE

INTRODUCTION

6.01 The primary system maintenance objective is to maintain call processing during error and/or fault intervals. To meet this objective, the following is accomplished relative to the CCT voice path assurance test on CCIS trunks:

- Detection of faults
 - Isolation of faulted equipment and removal of equipment from service via program control
 - Repair of equipment by craft personnel
 - Verification of repair by equipment test and fault detection circuits
 - Return of repaired equipment to service.
- 6.02** Craft personnel are notified of CCIS trunk voice path assurance test failures and CCT unit faults by teletypewriter (TTY) output message, office alarm equipment, and/or equipment indicating devices.
- 6.03** Further maintenance philosophy is described in Section 234-100-000.
- 6.04** Trunk maintenance is the responsibility of the trunk operations center (TOC). The maintenance operations center (MOC) and the terminal equipment center (TEC) are responsible for maintenance and repair of the CCT & LAT unit.

MAINTENANCE SOFTWARE

6.05 Scan and signal distributor points are used for equipment monitoring and control. Each CCT may be tested periodically, utilizing the CCIS LAT circuit, to determine if its operation meets established limits.

MAINTENANCE AIDS

6.06 The following units or panels are used to perform maintenance on the CCT & LAT unit.

- Power switch KS-20738, L3, on the miscellaneous frame A control panel J4A010AB, provides fuse alarm status and alarm signals to the signal processor and office alarm system.
- Power switch KS-20738, L4, on the CCT & LAT unit, provides manual control of unit power, manual power alarm test, power status and alarm signals to the signal processor, a power alarm signal to the office alarm system, and lamp indicators which

light to indicate power and operational status of the CCT & LAT unit.

- The +5V dc-dc converter contains an alarm indicator which lights to indicate a converter power alarm condition.
- The telephone and TTY jack unit assembly on the miscellaneous frame A control panel provides for telephone communication between frames and the use of the beltline channel (TTY and data set) at the frame.
- Fuse panel, J4A012AD, on the miscellaneous frame A, provides blown fuse indicators.

ROUTINE TASKS

6.08 The procedures for performing any routine tasks relative to the CCT & LAT unit are provided in the appropriate Task Oriented Practices (TOP) document.

REPAIR OR REPLACE TASKS

6.09 Repair or replace tasks relative to the CCT & LAT unit are provided in the appropriate TOP document or covered in training.

7. REFERENCES

7.01 The following is a list for further information relating to the CCIS CCT & LAT unit.

NUMBER	TITLE
SD-4A025-01	Miscellaneous Frame A Circuit
SD-4A064-01	CCIS Continuity Check Transceiver Circuit
SD-4A080-01	Assignment Rules for Scanner, Distributor, and Pulse Points
SD-4A081-01	CCIS Continuity Check Transceiver and Loop-Around Test Circuit

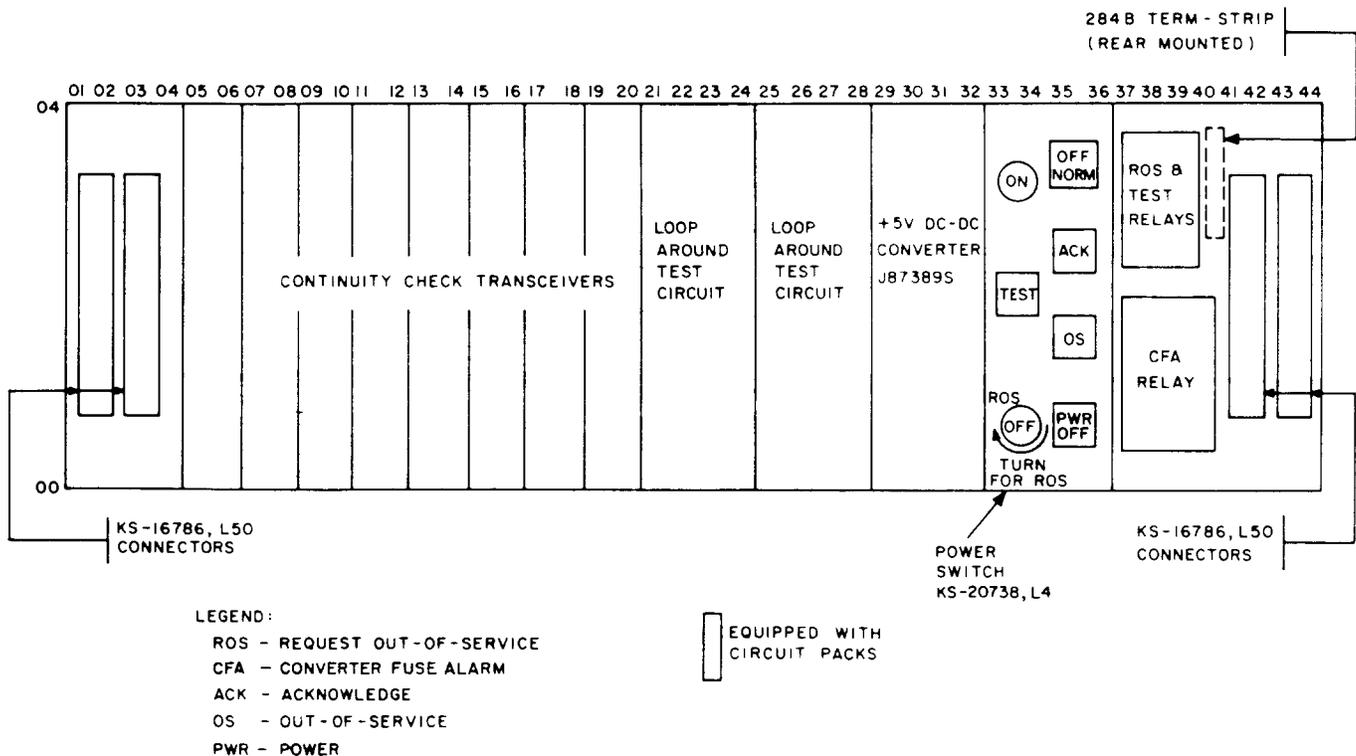


Fig. 1—CCIS CCT & LAT Unit J4A010AE-1—Equipment Identification

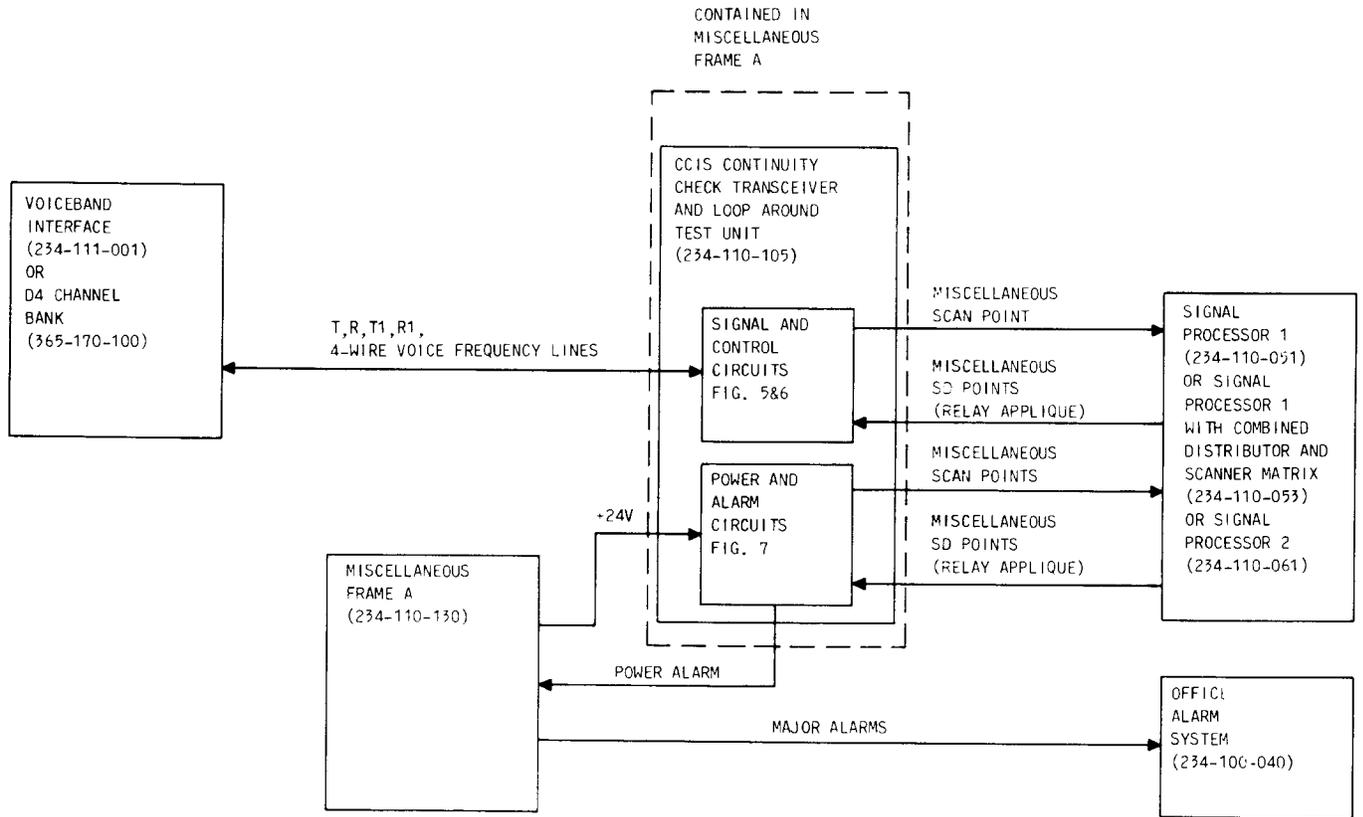


Fig. 2—CCIS CCT & LAT Unit—Functional Interface Block Diagram

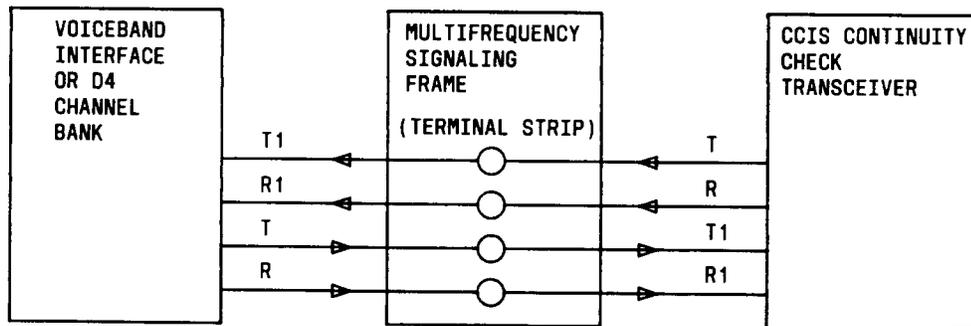


Fig. 3—Interconnections—CCT 4-Wire Voice Frequency Lines

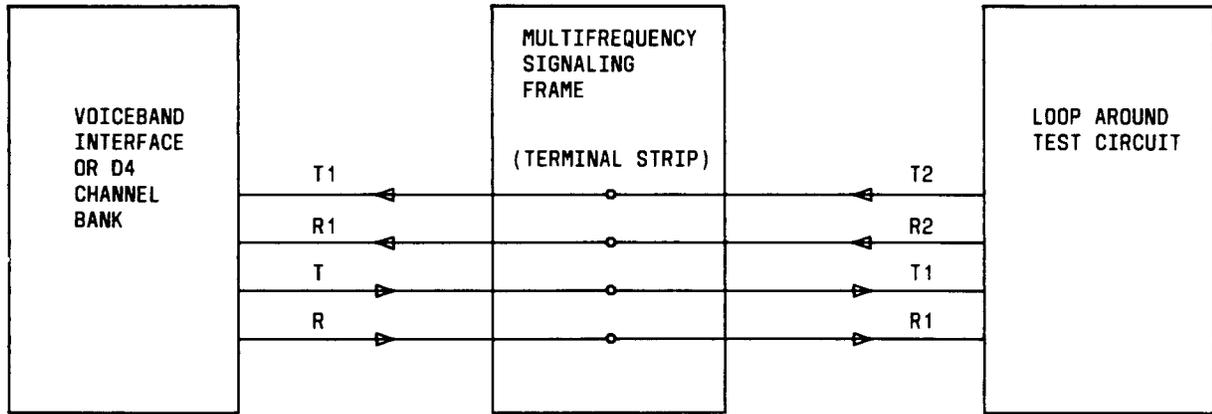


Fig. 4—Interconnections—LAT Circuit 4-Wire Voice Frequency Lines

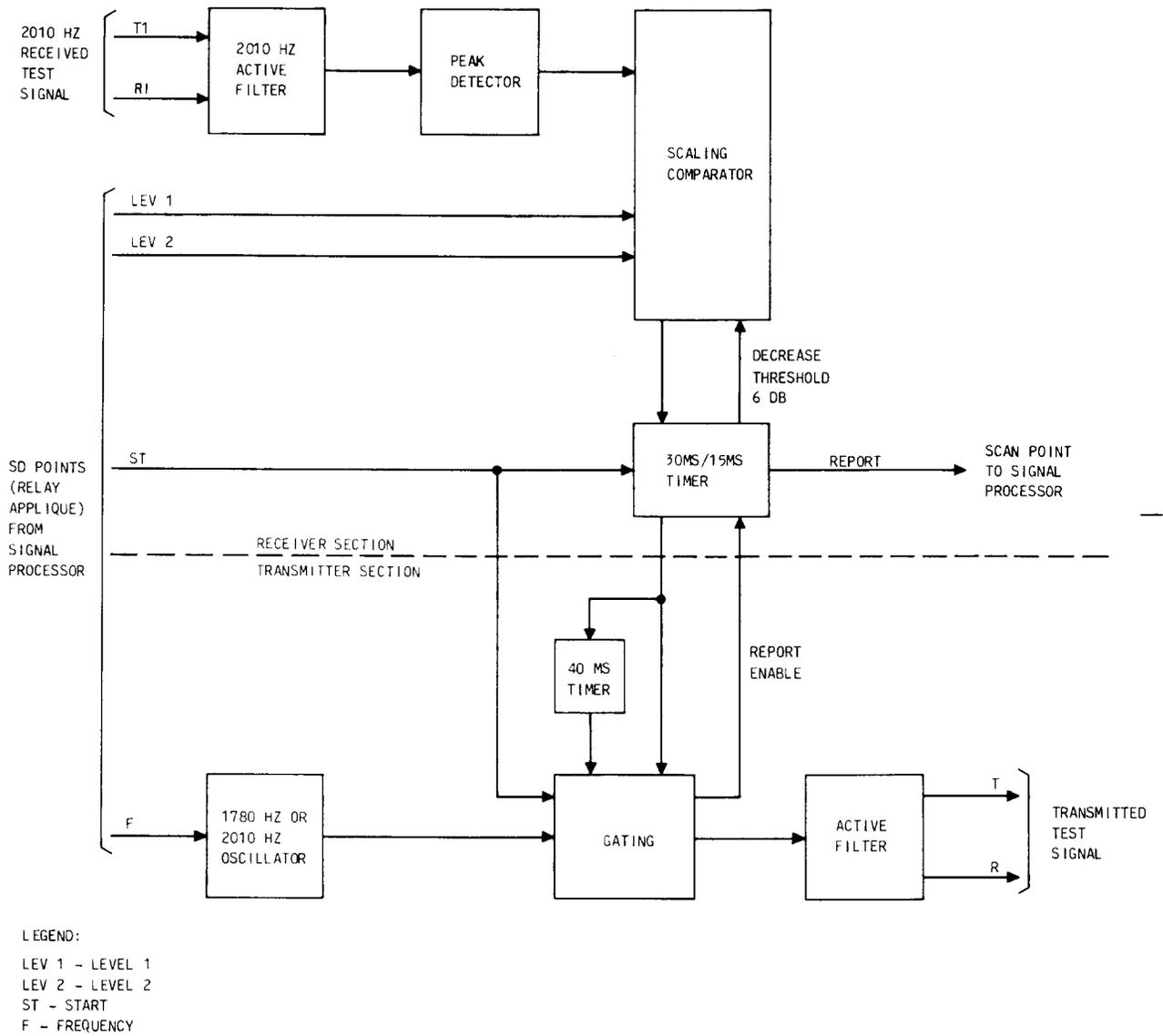


Fig. 5—CCIS Continuity Check Transceiver—Functional Block Diagram

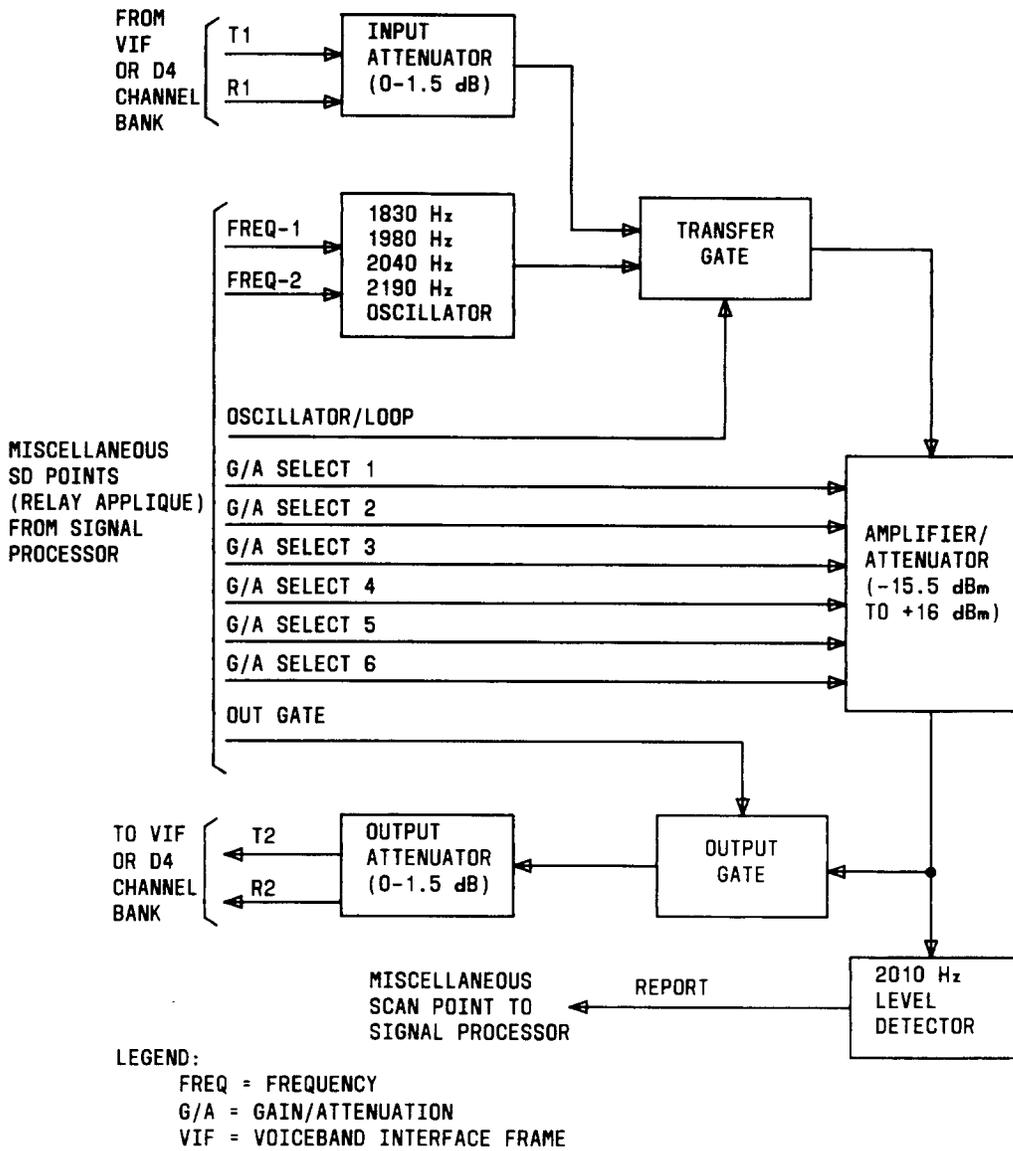
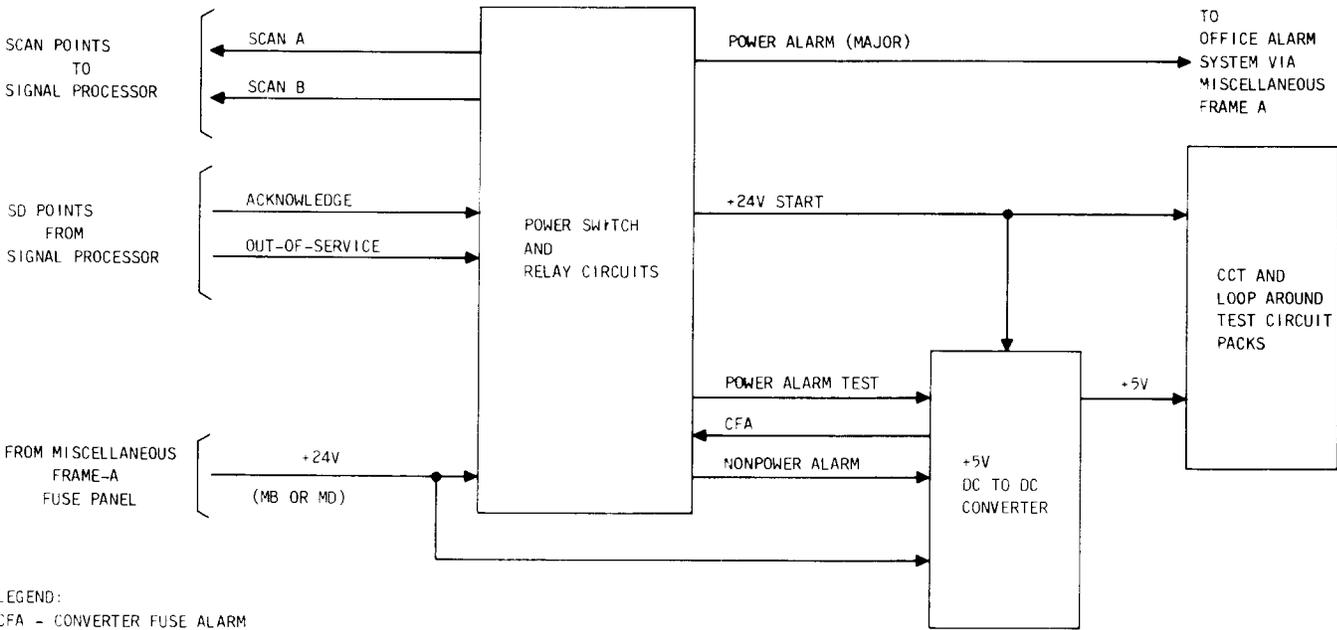


Fig. 6—CCIS LAT Circuit—Functional Block Diagram



LEGEND:
CFA - CONVERTER FUSE ALARM

Fig. 7—CCIS CCT & LAT Unit—Power and Alarm Circuits

TABLE A
 ABBREVIATIONS AND ACRONYMS

ABBREVIATION	TERM
ACK	Acknowledge
CCIS	Common Channel Interoffice Signaling
CCT	Continuity Check Transceiver
CFA	Converter Fuse Alarm
ESS	Electronic Switching System
LAT	Loop-Around Test
MF	Multifrequency
MOC	Maintenance Operations Center
OC	Overcurrent
OORV	Out-of-Range Voltage
OS	Out-of-Service
OV	Overvoltage
ROS	Request Out-of-Service
SD	Signal Distributor
TEC	Terminal Equipment Center
TOC	Trunk Operations Center
TOP	Task Oriented Practice
TTY	Teletypewriter

TABLE B

CCIS CONTINUITY CHECK TRANSCEIVER OPERATING MODES

	SD Point START = OPEN (Transponding)	SD Point START = CLOSED (Transceiving)
SD Point FREQUENCY = OPEN (2010 Hz Transmit)	IDLE (2010 Hz Transponding)	4-WIRE ORIGINATING TEST (2010 Hz Transmit) (2010 Hz Receive)
SD Point FREQUENCY = CLOSED (1780 Hz Transmit)	2-WIRE TRANSPONDING (2010 Hz Receive) (1780 Hz Transmit)	2-WIRE ORIGINATING TEST (1780 Hz Transmit) (2010 Hz Receive)