



SLC[®] Series 5 Carrier System

AUA150() RT POTS/SPOTS[®] Channel Unit — 5SCU1LV (AUA150) 5SC3PV0 (AUA150C)

Features/Functions

- Automatically provides loop-start or ground-start service
- Supports *CLASS*^{*} services
- Two channels
- Compatible with universal voice grade (UVG) requirements in TR-NWT-000057
- Compatible with calling number (CND) and calling name delivery (CNAM) services (AUA150C recommended)
- Faceplate test access to tip and ring for both channels
- Supports line side answer supervision (LSAS) (AUA150C)
- Extended range
- Faceplate BUSY LEDs
- On-hook transmission (OHT)
- Fast forward disconnect (except for AUA150 in *SPOTS* mode)
- Automatic level compensation (ALC) (AUA150C)
- Enhanced inventory (AUA150C)
- Conforms to appropriate industry standards
- UL[†] Recognized
- Automatically provides POTS or special service loss profile
- No option switches

* Service mark of Bell Communications Research, Inc.

† Registered trademark of Underwriters Laboratories Inc.

Description

This data sheet describes the AUA150() remote terminal (RT) POTS/*SPOTS* dual channel unit (COMCODE 106018500, AUA150; and 107627325, AUA150C) and is intended for the end-user of the unit. This data sheet has been reissued to introduce the AUA150C dual POTS/*SPOTS* current feed (CF) 1500 ohm extended range channel unit which features automatic level compensation (ALC), line side answer supervision (LSAS), and enhanced inventory. The AUA150C and AUA150 (its predecessor) channel units present a current feed interface to two tip/ring pairs and provide on hook transmission and *CLASS* compatibility. The AUA150B code represents a channel unit that was never manufactured and does not exist.

The AUA150() can be used in a *SLC*[®] Series 5 RT or multi-services distant terminal (MSDT), and in a *SLC*[®]-2000 central office terminal (COT), RT, or MSDT. However, the enhanced inventory feature of the AUA150C is only usable in a *SLC*-2000 RT or MSDT.

The AUA150() furnishes a 2-wire current feed interface to the customer loop and provides two channels of service. Balance impedance of both units is approximately 1100 ohms in parallel with 0.022 μ F. Structural impedance is 735 ohms in series with 2.16 μ F for the AUA150 and 600 ohms in series with 2.16 μ F for the AUA150C. The transmit and receive insertion losses for the AUA150 channel unit are both 0 dB when interfacing either a 600 or 900 ohm termination; insertion losses of the AUA150C are variable, reflecting the ALC feature. The unit automatically provides either a loop-start or a ground-start (PBX) signaling interface over loops as long as 1500 ohms. The ringing range of the AUA150() CU is to a large extent determined by the ringing generator employed by the bank. The 3A, 3B, and 3C ringing generators feeding 20 Hz ringing through an AUA150() CU will produce at least 40 Vac (TR-NWT-000057 requirement) across an impedance equivalent to five ringers (5 REN) through a loop of 1050 ohms (1100 ohms, AUA150C) or less. The AUA150() will ring four REN over loops of at least 1500 ohms.

The AUA150() channel unit can be used in a Series 5 universal arrangement or in a Mode 96 configuration with a *SLC* 96 central office terminal (COT), *5ESS*[®] switch digital carrier line unit (DCLU) or *5ESS* switch integrated digital carrier unit (IDCU) at the central office (CO). In a Series 5 universal arrangement, the COT end of the channel can be terminated with an AUA32 or AUA39() channel unit for locally switched special services, or an AUA31 or AUA38() POTS channel unit at the far end if only loop start signaling is required. In Mode 96 applications with a *SLC* 96 COT, the COT channel unit can be a WP36 *SPOTS* unit or, if only loop-start signaling is required, a WP10() POTS unit. Where an AUA150()/AUA39() *SPOTS* channel unit pair provides a loop-start circuit served by a *5ESS* switch, the RANGEX or ground reference option (see Table 1) of the *5ESS* switch must be set — otherwise, ringing will not be tripped during the silent interval.

During on-hook conditions, the channel unit is not powered down. On-hook transmission (OHT) in each direction is provided where the far end is terminated with an AUA38(), AUA39(), or WP10D channel unit, or a digital switch — see Table 1. This OHT capability, coupled with the OHT capability of the listed COT channel units in the COT-to-RT direction permits these combinations to provide several new services requiring OHT in that direction [for example, individual calling line identification (ICLID)]. On-hook insertion loss of the AUA150 is nominally 2.5 dB — when the far end is terminated with an AUA38() or AUA39() channel unit, end-to-end insertion loss is approximately 4 dB, somewhat less with *SLC* 96 channel units at the COT. The AUA150C has automatic level compensation in the on-hook state — See Table 2.

Loop range depends upon whether the AUA150() is part of the special service circuit. In a ground-start or loop-start locally switched special service application where the distant channel unit is a WP36, AUA32, or AUA39() (or the DCLU/IDCU *SPOTS* channel unit equivalent), the loop is limited to carrier serving area (CSA) range for transmission performance consistent with special service circuits. Where the distant channel unit is a WP10(), AUA31, or AUA38() (or the DCLU/IDCU POTS equivalent), the loop range extends to 1500 ohms (plus telset resistance) — over this range the AUA150() supplies current varying in amount from 30 mA (shortest loop) to a minimum of 20 mA (1500 ohms).

The AUA150() can be administered for use in loops from 0 to 1500 ohms. However, the ALC feature of the AUA150C, AUA158(), and AUA159() channel units provides a more consistent grade of service over the range of 0 to 900 ohms. Therefore, AT&T recommends using the AUA150C, AUA158() or AUA159() CU where loops are administered using a 900-ohm resistance guideline, reserving the AUA150 CUs held in inventory for use in loops greater than 900 ohms.

Figure 1 is the functional block diagram of the AUA150 CU. The AUA150C unit has the same edge connector functions. Figure 2 shows the faceplate diagram for the AUA150() CU. Table 1 lists the on-hook compatibility and Table 2 lists the salient electrical and transmission specifications for the AUA150C CU. Table 3 lists the environment specifications.

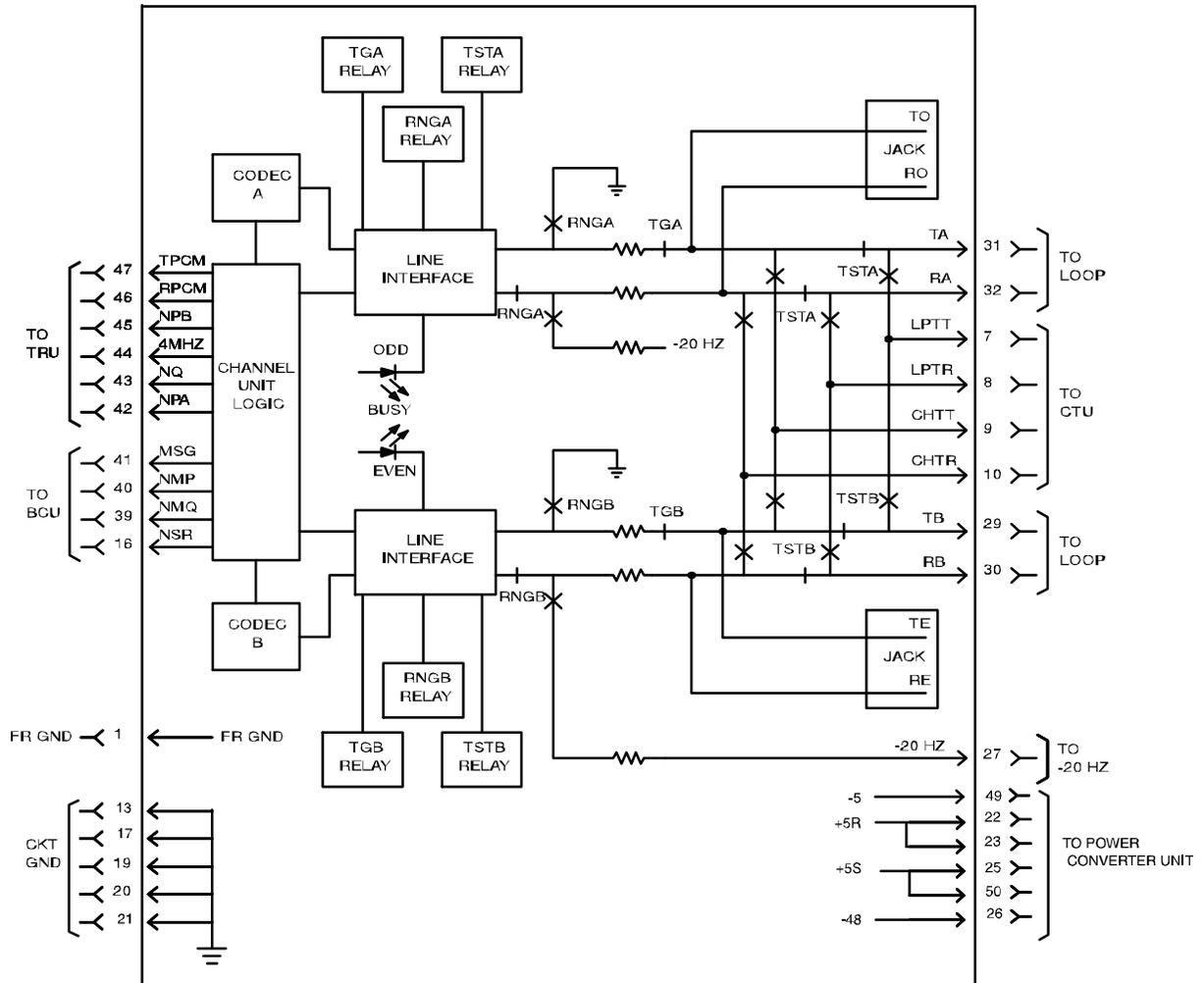


Figure 1. AUA150 Functional Block Diagram

Compatibility

The AUA150() channel unit is compatible with all *SLC* Series 5 Carrier System feature packages and with the *SLC*-2000 Access System. The far-end termination can be any of the following units.

- AUA32 *SPOTS* channel unit
- AUA39() *SPOTS* channel unit
- AUA31 POTS channel unit
- AUA38() POTS channel unit
- *SLC* 96 WP10() POTS channel unit
- *SLC* 96 WP36() *SPOTS* channel unit
- *SLC* -2000 *SPQ*[®]300 POTS channel unit
- *SLC* -2000 *SPQ*[®]340 *SPOTS* channel unit
- *5ESS* switch digital carrier line unit (DCLU)
- *5ESS* switch integrated digital carrier unit (IDCU)

The AUA150C supports line side answer supervision (LSAS) when used with an AUA39B, *SPQ*300, or *SPQ*340 (universal configuration), or suitably programmed local digital switch (integrated configuration).

A forward disconnect feature is furnished in all these configurations. In the POTS mode, the AUA150 provides a fast forward disconnect feature (recognizes an open switch interval longer than 50 msec). However, in the *SPOTS* mode for AUA150, the feature comprises open switching interval protection (the OSI must be longer than 350 msec). The AUA150C unit exhibits fast forward disconnect in both POTS and *SPOTS* modes.

The AUA150() channel unit is compatible with pair gain test controller (PGTC) and extended test controller (XTC) test systems in all its configurations. There are no options or settings that need to be selected on this channel unit.

Specifications

Table 1 gives the on-hook Transmission Capabilities for the AUA150() CU.

Table 1. AUA150() POTS/SPOTS CU — On-hook Transmission Capability

ON-HOOK TRANSMISSION CAPABILITIES			
CO Termination	Signaling	Direction	OHT Services CND, MWI, MR
WP10	LS	COT→RT	✓*
WP10B	LS	COT→RT	✓*
WP10C	LS	COT→RT	✓*
AUA38()	LS	COT↔RT	✓
WP10D	LS	COT↔RT	✓
WP36	LS /GS	COT→RT	✓*
AUA39	LS [†] /GS	COT↔RT	✓ [‡]
AUA39B	LS /GS	COT↔RT	✓
INTEGRATED:			
POTS CU mode	LS	IDCU/DCLU [§] ↔RT	✓
SPOTS® CU mode	LS /GS	IDCU/DCLU↔RT	✓

Legend:

CND — Calling number delivery (CND). Individual calling line identification (ICLID) feature of CND transmits number, using frequency shift keying (FSK), during silent ringing interval

MWI — Visual message waiting indication(MWI). CO switch transmits FSK to turn on indicator during idle state.

MR — Meter reading.

LS — Loop start (LS) signaling.

GS — Ground start (GS) signaling.

* Meter must present off-hook termination when responding to poll.

† When an AUA39 CU is connected to the floating battery feed of a 5ESS Switch, either the RANGEX or GNDREF 5ESS Switch option should be set, to provide the necessary low resistance tip/ground interface when the switch sends the CND message. The RANGEX option is preferred. The AUA39B CU does not require these switch options:

RANGEX=Y [up to Release 5E9(2)] or RANGEX=EXT [Release 5E9(2) or later]

GNDREF=Y

‡ CND only

§ Digital carrier line unit (DCLU) or integrated digital carrier unit (IDCU) interface feature of 5ESS Switch, or other switch with digital loop interface compliant with Bellcore TR-TSY-000008. (Compatibility for MWI on ground start circuits is not covered by TR8.)

Table 2 lists salient electrical and transmission specifications for AUA150() channel unit. The parameters are off-hook unless specified otherwise. Table 3 lists the environment specifications.

Table 2. Salient AUA150() Electrical and Transmission Specifications¹

Parameter	POTS	Special Services
Loop resistance (excluding telset) AUA150()	0-1500 ohms	CSA
1 kHz VF loss between CO and network interface (NIF) at customer location, customer premises equipment (CPE) off-hook: AUA150 AUA150C	0 dB to 8* dB 3.5 dB to 8* dB	0 dB to 5 dB 2 dB to 5 dB
Nominal 1 kHz VF loss, AUA150() only, CPE off-hook: AUA150 AUA150C	0 dB 0 dB to 5 dB	0 dB 0 dB to 3.4 dB
Nominal 1 kHz VF loss, AUA150() only, CPE on-hook: AUA150 AUA150C First installed, telset on-hook, AUA150C	2.5 dB 2.75 dB to 7.75 dB 7 dB	2.5 dB 4.35 dB to 7.75 dB 7 dB
Return loss at COT (reference Z of 900 ohms + 2.16 μ F, AUA150() terminated at voice frequencies with 900 ohms + 2.16 μ F for POTS or TR-57 CSA test loops for special services, DC resistance of off-hook loop terminations < 430 ohms, CPE on-hook or off-hook) AUA150 AUA150C	ERL > 18 dB, SRL > 10 dB ERL > 18 dB, SRL > 10 dB	ERL > 8 dB, SRL > 5 dB ERL > 10 dB, SRL > 5 dB
Return loss at RT (reference Z of 600 ohms + 2.16 μ F, CO terminated with 900 ohms + 2.16 μ F, off-hook DC resistance of < 430 ohms, CPE on-hook or off-hook) : AUA150 AUA150C	ERL > 18 dB, SRL > 10 dB ERL > 18 dB, SRL > 10 dB	ERL > 18 dB, SRL > 11 dB ERL > 19 dB, SRL > 11 dB
Frequency response (loss relative to 1004 Hz, end to end), AUA150()	<u>Frequency range</u> 300-3000 Hz 3200 Hz	-0.5 dB to +1.0 dB -0.5 dB to +1.5 dB
Structural impedance (output impedance): AUA150 AUA150C	735 ohms + 2.16 μ F 600 ohms + 2.16 μ F	735 ohms + 2.16 μ F 600 ohms + 2.16 μ F
Impulse noise at a threshold of 47 dB _{BrnC0} for 15 minutes, AUA150()	\leq 15 counts	\leq 15 counts

* Assumes 26 gauge cable is loaded beyond 15 kft.

1 End-to-end performance specified with AUA38() or AUA39() at COT, terminated with 900 ohms + 2.16 μ F.

Table 3. Environmental Specifications

<p>A. Temperature Range (Ambient)</p> <ol style="list-style-type: none"> 1. Operating, per TR-NWT-000057: in AT&T cabinet mounted RT, outside ambient temperatures of -40° F with no solar load to +115° F with maximum solar load and maximum power dissipation. AT&T cabinets are designed to assure that the components within do not exceed their rated temperatures for the above conditions. 2. Storage, per TR-NWT-000057: ambient temperatures of -40° to 140° F.
<p>B. Relative Humidity</p> <ol style="list-style-type: none"> 1. Operating, per TR-NWT-000057. For outside ambient temperature 84° F or less, relative humidity of 5% to 95%. For ambient temperatures above 84° F, the relative humidity is limited to that corresponding to a specified humidity of 0.024 pounds of water per pound of dry air. 2. Storage, per TR-NWT-000057: ambient temperatures 84° F or less, 10% to 95%. For ambient temperatures above 84° F, the relative humidity is limited to that corresponding to a specified humidity of 0.024 pounds of water per pound of dry air.

Installation and Testing

There are no switches to set on this unit. Procedures for testing the unit are given in AT&T 363-205-402 *SLC Series 5 Carrier System Channel Unit Installation and Testing*.

The AUA150(), in all its applications, is compatible with mechanized loop testing (MLT) and the pair gain test controller (PGTC) and the extended test controller (XTC) test systems.

The faceplate jack provides easy test access to the tip (T) and ring (R) of both the odd (O) and the even (E) channels.

Faceplate Features

The AUA150 and AUA150C channel units share a common faceplate layout. The AUA150() has one faceplate jack and two red LED indicators. The faceplate jack provides convenient test access to the tip (T) and ring (R) of both the odd (O) and even (E) channels through the ITT RTG16L2H15A channel unit faceplate test cord (Comcode 405755208).

The faceplate LEDs indicate as follows:

- **ODD BUSY** (Red LED): When lit, indicates that the odd channel is busy.
- **EVEN BUSY** (Red LED): When lit, indicates that the even channel is busy.

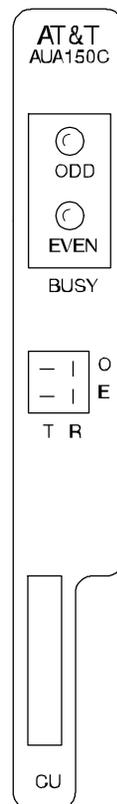


Figure 2. AUA150() Faceplate Diagram

References

The following documents provide additional information about the use of this channel unit in the *SLC Series 5 Carrier System* and *SLC-2000 Access System*:

- AT&T 363-205-010 *SLC Series 5 Carrier System Application and Planning Guide*
- AT&T 363-205-401 *SLC Series 5 Carrier System Remote Terminal Acceptance and Turnup*
- AT&T 363-205-402 *SLC Series 5 Carrier System Channel Unit Installation and Testing*
- AT&T 363-205-500 *SLC Series 5 Carrier System Maintenance and Trouble Clearing*
- AT&T 363-208-000 *SLC-2000 Access System Application, Planning, and Ordering Guide*
- AT&T 915-710-115 *SLC Series 5 Carrier System Application Engineering*

Technical Assistance

Follow local procedures for obtaining technical assistance. AT&T also provides in-hours or emergency out-of-hours help for the *SLC Series 5 Carrier System* and the *SLC-2000 Access System*. Call the AT&T Regional Technical Assistance Center at 1-800-225-RTAC.

Ordering Information

Additional copies of this document (AT&T 363-005-133) are available from the Customer Information Center — call 1-800-432-6600.

Comments

Comments about this document can be directed to:

AT&T Network Systems Customer Education and Training
Documentation Services
2400 Reynolda Road
Winston-Salem, NC 27106-4606

Copyright Information

Copyright© 1995 AT&T.
All Rights Reserved.

This material is protected by the copyright laws of the United States and other countries. It may not be reproduced, distributed, or altered in any fashion by any entity including other AT&T business units or divisions without the expressed written consent of the Customer Education and Training Organization.

For permission to reproduce or distribute, please call: 201-386-6813.

