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## **SLC<sup>®</sup> Series 5 Carrier System**

### **AUA42( ) 2-Wire Special Services E SPOTS<sup>®</sup> Channel Unit — 5SCU690 (AUA42), 5SCU6E0 (AUA42B)**

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#### **Features/Functions**

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- Two-wire special services
  - Loop or ground start, local or FX
  - Loop reverse battery (DPT)
  - Private line, voice or data (TO)
- Provisionable transmission treatment
- Reverse battery capability for LSAS applications
- On-hook transmission (OHT), full-time or Caller ID only
- Supports CLASS\* services
- Fast forward disconnect
- Faceplate test access to tip and ring (AUA42B only)
- Faceplate BUSY LEDs
- Enhanced inventory read-out (AUA42B only)
- Conforms to appropriate industry standards

#### **Description**

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This data sheet describes the AUA42( ) 2-wire special services E SPOTS<sup>®</sup> channel unit (CU) (COMCODE 103840609, AUA42; 106932189, AUA42B) and is intended for the end-user of the unit. The AUA42( ) is a current sink (CS) unit and is primarily intended for use in 2-wire nonlocally-switched ground-start and

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loop-start special services, 2-wire nonswitched private lines, and direct-inward-dial (DID) trunks. The unit may also be used in locally-switched services.

This data sheet has been reissued to include information about the AUA42B and its applications.

The AUA42( ) channel unit provides two channels of service. Each channel can be used independently of the other to provide any of three functions.

- a. Foreign exchange- office end (FXO) -- The FXO function is used for a loop-start or ground-start application, nonlocally-switched or locally-switched. Typically, nonlocally-switched applications are foreign exchange trunks and lines and off-premises PBX station lines. For the FXO function, the channel unit may be used in either the remote terminal (RT) or central office terminal (COT), depending on the application.
- b. Dial pulse terminating (DPT) -- The DPT function is used for a DID application only, with either dial pulse or multifrequency signaling. For this function, the AUA42( ) is located in the RT.
- c. Transmission only (TO) -- The TO function is used for a private line application, with no DC signaling. For this function, the channel unit may be located in either the RT or COT.

The AUA42( ) channel unit has transmission and signaling options which must be set before service can be provided. The unit does not have physical switches; instead, option information is written into memory registers located on the channel unit. For this purpose, the Series 5 craft interface unit (CIU - J99404TA) or Special Channel Administration Tool (SCAT, Comcode 107040347) and bank control unit (BCU) are used. All transmission and signaling options and the function type (FXO, DPT, or TO) for either channel on the unit are set by entering commands into the CIU/SCAT which then transmits the information to the BCU which stores it in nonvolatile system memory. The BCU then writes the options into the CU registers when the CU is installed. If the CU is already installed, the BCU writes the option information into the channel unit registers immediately after it receives the information from the CIU/SCAT. Unplugging the channel unit does not erase the option information stored in system memory; reinserting the channel unit causes the options to be rewritten immediately into the CU registers by the BCU.

The CIU is also used during manual testing of the transmission performance of either channel on the AUA42( ) channel unit. The procedures for setting options and performing tests with the CIU are described in AT&T Practice 363-205-402. The CIU is described in AT&T Practice 363-205-101.

The AUA42B includes enhanced capability for plug-in inventory, a capability supported by the *SLC-2000* Access System. The unit stores in its non-volatile memory an inventory record that includes its 10-character CLEI\* code.

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Table 1 lists the transmission and signaling options, and the associated ranges for the AUA42( ). AT&T 915-710-116 provides guidelines for selecting option settings for the AUA42( ) CU, and also describes the various applications of this unit.

**Table 1. Range of Settings for AUA42( ) Channel Unit Options**

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<u>Option</u>	<u>Range</u>
Hybrid impedance (Output impedance, Structural impedance)	900 ohms or 600 ohms
Hybrid balance	0 to 15 in steps of 1
Transmit gain	-1.0 dB to 6.75 dB in steps of 0.25 dB
Receive gain	-8.0 dB to 1.5 dB in steps of 0.25 dB
Equalizer slope	0 to 7 in steps of 1
On-hook transmission	Yes or No
Toll diversion	Yes or No
Signaling type	Loop start (LS) or ground start (GS)

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Table 2 lists the allowable options for the FXO, DPT, and TO functions.

**Table 2. Options for Each AUA42( ) Channel Unit Function**

<u>Option</u>	<u>Channel Unit Function</u>		
	<u>FXO</u>	<u>DPT</u>	<u>TO</u>
Hybrid impedance *	✓	✓	✓
Hybrid balance	✓	✓	✓
Transmit gain	✓	✓	✓
Receive gain	✓	✓	✓
Equalizer slope †	✓	✓	✓
Toll diversion	✓		
Signaling type	✓		
On-hook transmission ‡	✓		

\* When the channel unit faces outside plant cable, the hybrid impedance should be set to 600 ohms.

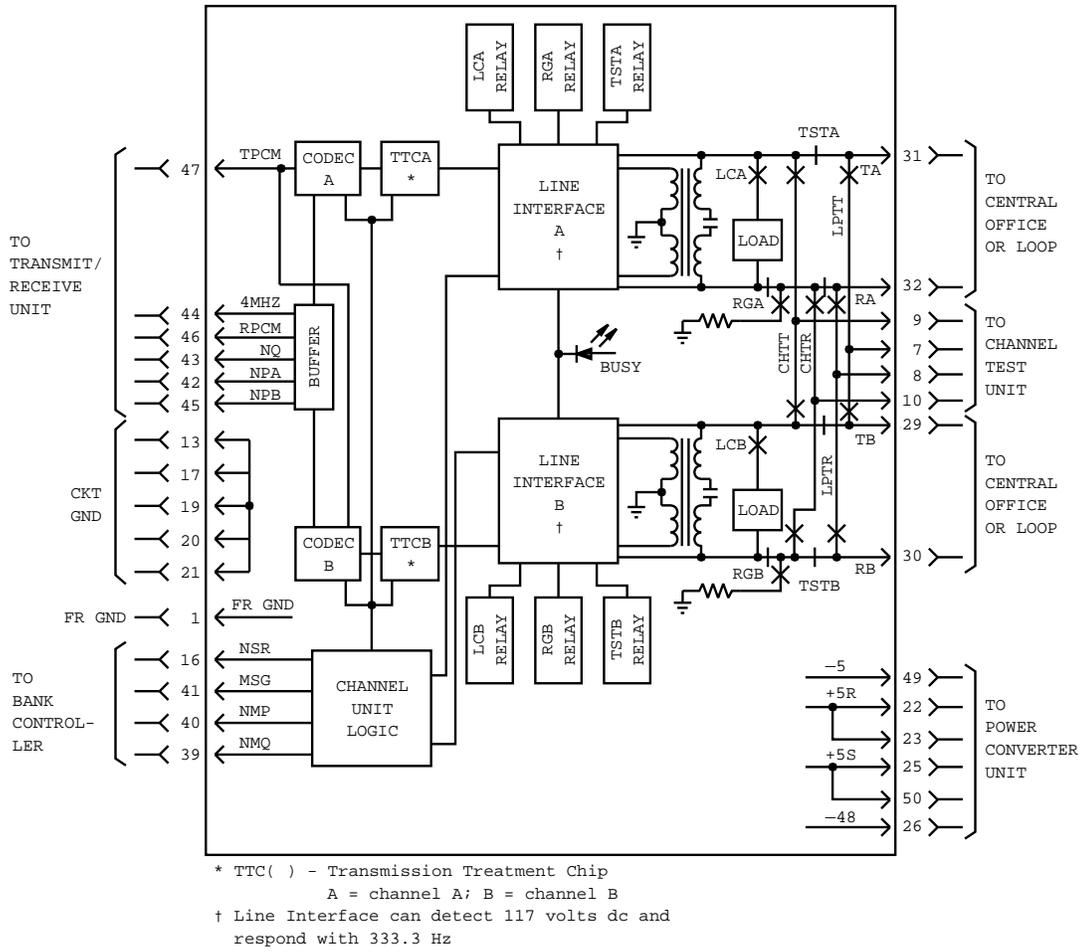
† The 1-kHz gain of the channel unit is independent of the equalizer setting.

‡ This OHT provides full-time transmission while the CPE is on-hook.

The AUA42( ) provides two features that enhance service in locally-switched loop-start applications: reverse battery detection and on-hook transmission.

- Reverse battery detection - If the unit is provisioned for Toll Diversion, reversal of battery polarity by the switch is detected and signaled to an AUA43( ) CU at the RT; this feature provides compatibility with line side answer supervision (LSAS).
- On-hook Transmission (OHT). If the unit is provisioned for OHT it transmits voiceband signals in each direction, but with reduced gain, when it receives on-hook signaling from the RT. When provisioned for OHT=No, the unit still provides OHT during the silent interval of ringing. This OHT feature means the AUA42( ) is compatible with calling party identification (CPI) and other OHT services.

Figure 1 is a block diagram of the AUA42. The AUA42B has the same edge connector functions.



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Figure 1. AUA42 Block Diagram

## Compatibility

The AUA42( ) channel unit is end-to-end compatible with the AUA42( ) and AUA43( ) 2-wire CUs. The AUA42( ) is end-to-end compatible with D4-type CUs using FXS, DPO, and TO signalling.

For private line applications (no DC signaling), the AUA42( ) CU is end-to-end compatible with the AUA41( ) 4-wire CU.

The AUA42( ) channel unit may interface with a switching machine, other transmission equipment, or cable. When it interfaces with cable, the cable must conform to the carrier serving area (CSA) design rules, which are described in AT&T Practice 363-205-010.

There are several restrictions in the application of these units.

- If the unit is being used in a loop-start circuit facing a 5ESS® switch providing CPI or other OHT service, the CU should be provisioned for LS signaling. Otherwise, the ground reference=Yes option must be programmed in the 5ESS.
- The AUA42, when provisioned for TO, is *not* end-to-end compatible with a D4 2TO or other TO CU which sends the A B (D4 or SLC 96) or A B C D (Series 5) signalling code with B=0. Codes with B=0 in a ground-start circuit represent the grounded ring condition, and the AUA42 responds by greatly increasing its transmission loss. The AUA42B, AUA43 and AUA43B *are* end-to-end compatible with such TO units. In the TO mode, the AUA42B, AUA43 and AUA43B ignore the signalling codes which they receive.
- If the forward disconnect feature is required, the OHT=Yes option cannot be selected for the AUA42, but can be selected for the AUA42B.
- For DID service, the AUA42B is restricted to applications where the switch complies with the LSSGR Bellcore standard for switches, and the PBX complies with ANSI standard EIA/TIA-464-A for PBXs. This restriction assures that dial pulse distortion complies with TR-NWT-000057.

For the FX0 and DPT functions, the unit permanently selects the 2.5-second delayed busy option on trunk processing, i.e., 2.5 seconds after receipt of a carrier line failure from the Series 5 system the channel unit will busy out the service.

The AUA42( ) channel can be used in a Series 5 system equipped for Enhanced FPB, Feature Packages C, D, or 303, or the INA-RT, or in the SLC-2000 Access System, Release 2.0 or later.

Further compatibility and application information can be found in AT&T 915-710-116.

## Specifications

**Table 3. Salient Parameters for 2-Wire E-SPOTS® AUA42() Channel Unit**  
(Off-hook unless specified)

Parameter	Condition	Value																
Equalization		Equalized CSA cable rolloff at 0.4 k Hz varies from 0.0 dB to 1.1 dB; at 2.8 kHz, rolloff varies from 0.3 dB to 1.75 dB																
Balance capability, CSA loops	At digital line interface of channel unit facing loop, with zero transmit and receive gain.	ERL ≥ 14 SRL ≥ 9																
Idle channel noise	AUA42/AUA43 pair AUA42B/AUA43B pair	23 dBm <sub>c0</sub> 20 dBm <sub>c0</sub>																
Impulse noise	AUA42( ), measured at 65 dBm <sub>c0</sub> with holding tone at -13 dBm <sub>0</sub> AUA42B, measured at 47 dBm <sub>c0</sub> with no holding tone, on-hook & off-hook	≤15 counts in 15 minutes ≤15 counts in 15 minutes																
On-hook loss, 1004 Hz, (Nominal)	"OHT=YES;" Terminated with Structural Impedance; Slope=0  IMP=600 ohms IMP=900 ohms	<table border="1"> <thead> <tr> <th colspan="2">AUA42</th> <th colspan="2">AUA42B</th> </tr> <tr> <th>Rcv (to T/R)</th> <th>Xmt (from T/R)</th> <th>Rcv (to T/R)</th> <th>Xmt (from T/R)</th> </tr> </thead> <tbody> <tr> <td>9dB</td> <td>2.5dB</td> <td>2.5dB</td> <td>2.5dB</td> </tr> <tr> <td>9dB</td> <td>4.5dB</td> <td>2.5dB</td> <td>2.5dB</td> </tr> </tbody> </table>	AUA42		AUA42B		Rcv (to T/R)	Xmt (from T/R)	Rcv (to T/R)	Xmt (from T/R)	9dB	2.5dB	2.5dB	2.5dB	9dB	4.5dB	2.5dB	2.5dB
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9dB	4.5dB	2.5dB	2.5dB															
On-hook loss, 1004 Hz, (Nominal)	"OHT=NO;" During silent interval of ringing Terminated with Structural Impedance; Slope=0  IMP=600 ohms IMP=900 ohms	<table border="1"> <thead> <tr> <th colspan="2">AUA42</th> <th colspan="2">AUA42B</th> </tr> <tr> <th>Rcv (to T/R)</th> <th>Xmt (from T/R)</th> <th>Rcv (to T/R)</th> <th>Xmt (from T/R)</th> </tr> </thead> <tbody> <tr> <td>9dB</td> <td>no trans.</td> <td>2.5dB</td> <td>2.5dB</td> </tr> <tr> <td>9dB</td> <td>no trans.</td> <td>2.5dB</td> <td>2.5dB</td> </tr> </tbody> </table>	AUA42		AUA42B		Rcv (to T/R)	Xmt (from T/R)	Rcv (to T/R)	Xmt (from T/R)	9dB	no trans.	2.5dB	2.5dB	9dB	no trans.	2.5dB	2.5dB
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## Faceplate Features

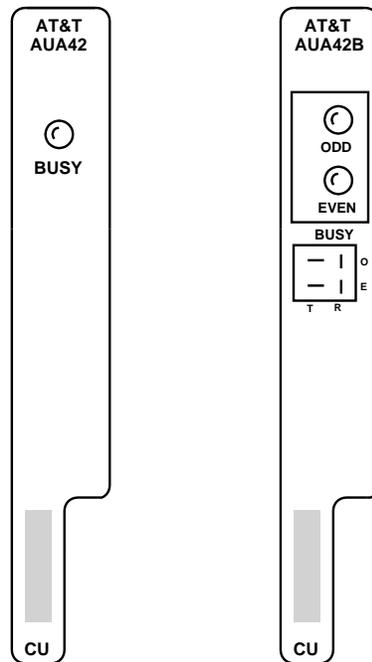
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Figure 2 shows the AUA42 and AUA42B faceplates. The AUA42B faceplate includes test access to tip and ring through the ITT RTG16L2H15A channel unit faceplate test cord (COMCODE 405755208). The following LED indicators are located on the faceplates of the AUA42 and AUA42B:

**BUSY** (Red LED): One of the channels is busy when lit.

**ODD BUSY** (Red LED): The ODD channel is busy when lit.

**EVEN BUSY** (Red LED): The EVEN channel is busy when lit.



aua43bface.ps

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**Figure 2. AUA42 and AUA42B Faceplate Diagrams**

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## References

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The following documents provide additional information about 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 363-205-402 *SLC Series 5 Carrier System Channel Unit Installation and Testing.*
- AT&T 363-208-000 *SLC-2000 Access System Application and Planning Guide.*
- AT&T 915-710-116 *SLC Series 5 Carrier System Channel Unit Application and Prescription Setting.*

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## Technical Assistance

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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*. Call the AT&T Regional Technical Assistance Center at **1-800-225-RTAC**.

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## Ordering Information

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Additional copies of this document (AT&T 363-005-106) are available from the Customer Information Center — call 1-800-432-6600.

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## Comments

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