



Atomic



Copper 29

Telephone hybrid with -80dB separation

GlenSound invented the world's first hybrid in 1966 for the BBC. Current technology, combined with the GlenSound Engineers understanding of digital systems for audio, have presented the environment to develop the ultimate telephone balancing unit.

GlenSound presents the Copper 29 as part of the Atomic range, as it is considered to excel in its application.

Features

- Precision telephone balancing unit / hybrid with -80dB separation
- Dual DSP, with digital control of all key systems
- Dedicated Echo Cancellation
- Automatic gain control and compression
- Configurable auto answer
- Serial and loop remote control options
- LED PPMs for input and output
- Analogue and AES inputs and outputs
- Available as a 1U subrack or desktop unit
- DIP switches for setup and configuration
- HEX switch for worldwide impedance matching
- Available in desk or rack mounting versions

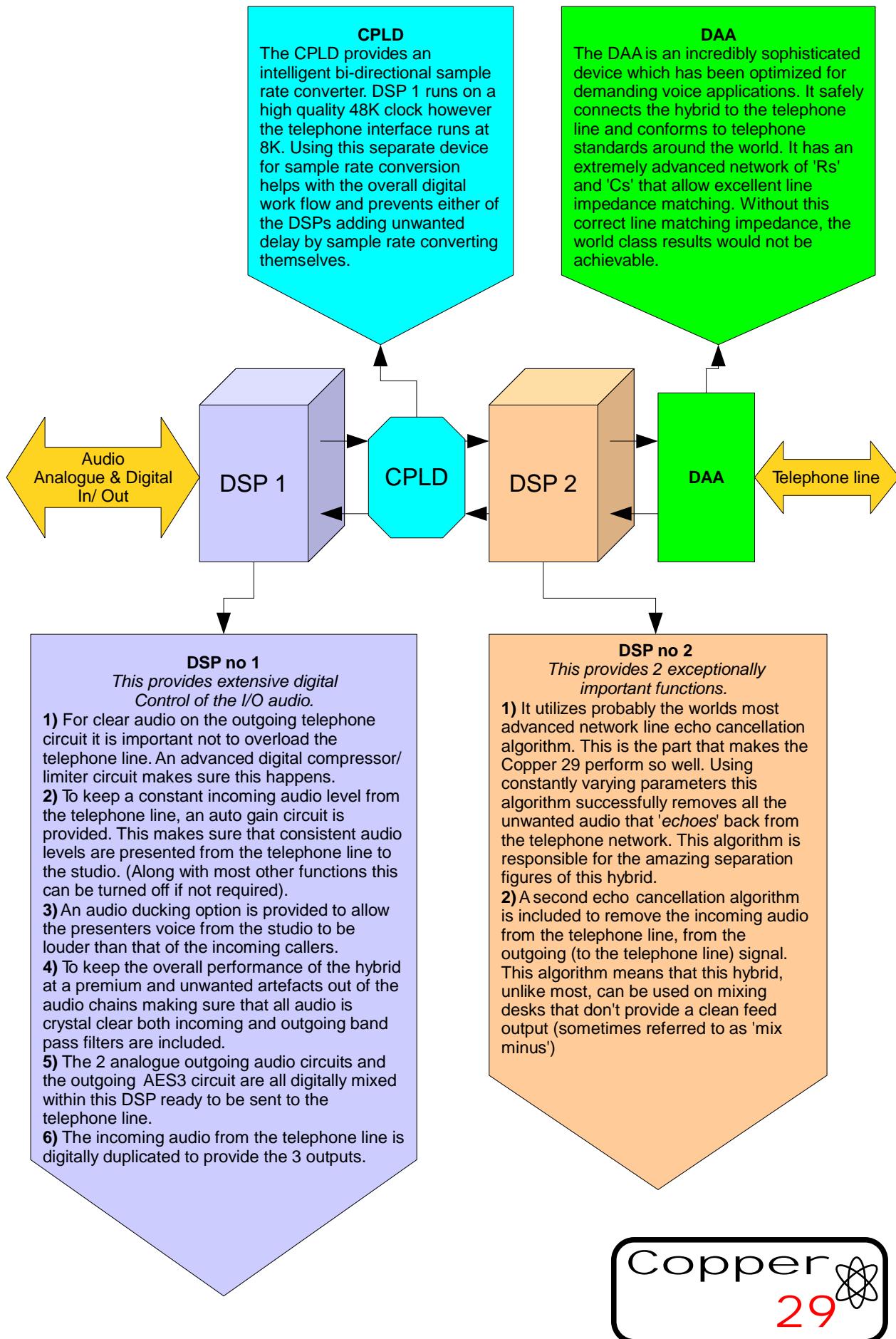
telephone hybrid

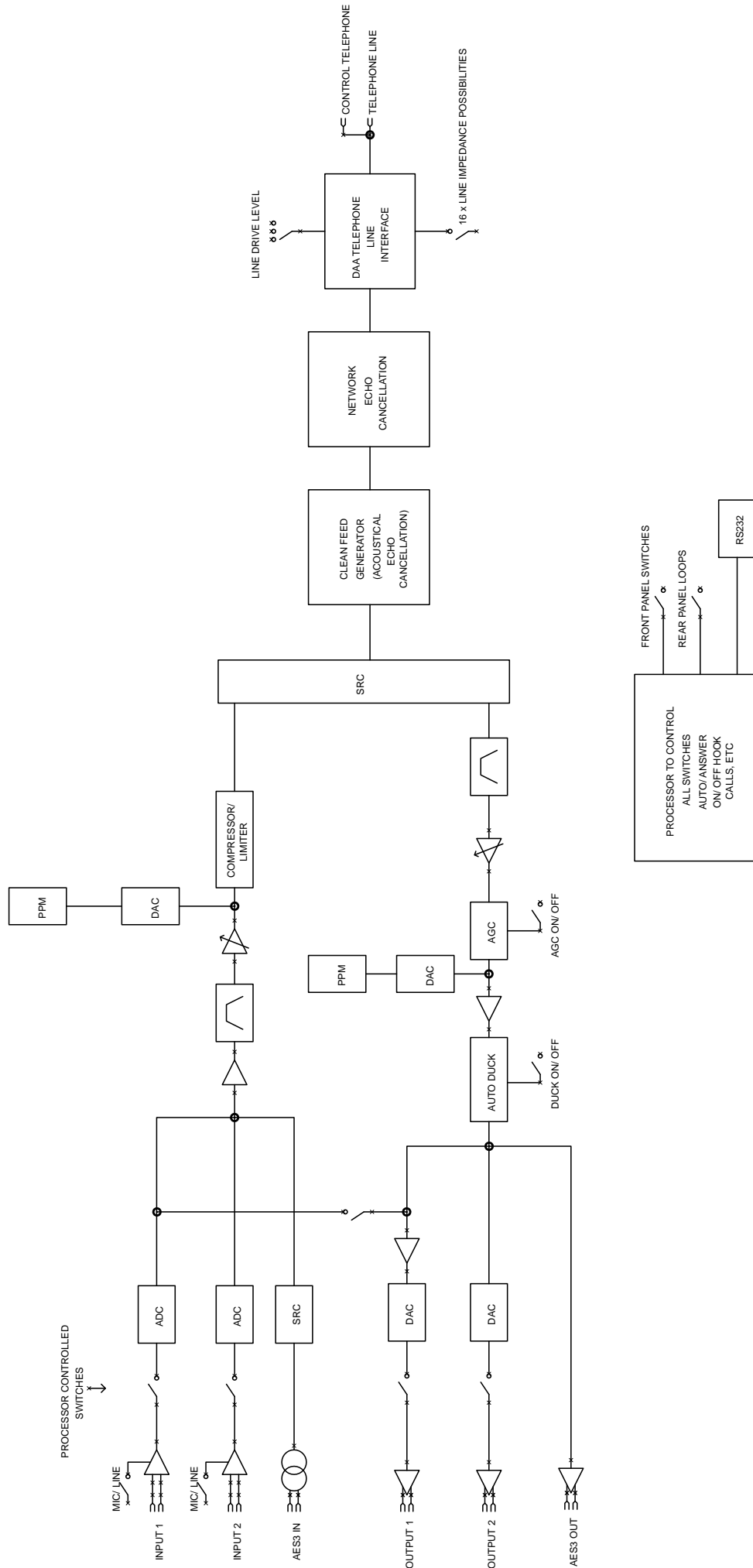
ATOMI C Copper 29

- **Analogue and Digital I/O**
The maximum flexibility is offered with analogue and digital audio connections
- **Twin DSP Processing and Control**
Two digital signal processors are used in the Copper 29 to allow dedicated control of the very important echo cancellation routines in one, whilst employing a second that is dedicated to the input/output process.
- **Compressor and Limiter - DSP1**
The incoming audio into the Copper 29 must be at the correct levels to start with. DSP1 manages the incoming analogue and digital audio with compression and limiting so as to not overload the telephone line.
- **Automatic Gain Control - DSP1**
Our automatic gain control maintains a constant caller level on the Copper 29 output making it easier to manage for the studio.
- **Automatic Caller Ducking - DSP1**
If there is an incoming audio signal into the Copper 29 from the studio, then the caller level will be ducked. This is to stop the caller talking over a presenter.
- **Band Pass Filters - DSP1**
Incoming and outgoing audio is put through band pass filters to remove unwanted artefacts.
- **The World's Finest Echo Cancellation Algorithm - DSP2**
Our impressive separation figures are a result of our dedicated echo cancellation system developed by the GlenSound Digital Design Team.
- **Internal Mix Minus Generation - DSP2**
A second algorithm in our echo canceller produces an internal mix minus.
- **Intelligent Sample Rate Converter**
Our CPLD device manages sample rate conversion and removes any unnecessary delay.
- **Worldwide Line Impedance Matching**
A DAA device optimized for voice applications is used to match worldwide impedance variations on analogue telephone circuits.
- **PPM Meters**
Both the input and output have an 8 bar LED PPM meter
- **Adjustable Level Control**
The input and outputs both have adjustable level control
- **Auto Answer**
When selected, the auto answer function answers an incoming call after a preset number of rings.
- **Remote Control**
System control is available via a rear panel dsub 15 connector. This contains RS232 and 8 loops. RS232 gives you full setup and system control, where the loops give you on/off hook, divert, and 4 audio switches.
- **Handset Interface**
RJ11 connection to an external telephone for dialling.



Workflow Diagram





Atomic Copper 29

VERSIONS

COPPER 29-S
COPPER 29-T
COPPER 29-SD

19 inch 1RU single TBU
19 inch 1RU twin TBU
Single Desktop TBU

GENERAL SPECIFICATIONS

HEIGHT (ALL) 1RU
WIDTH (29-S and 29-T) 19 inch
WIDTH 29-SD 290mm
DEPTH (ALL Excluding Connectors) 220mm
POWER INPUT 90 to 240 VAC 50 – 60 Hz
AUDIO CONNECTORS Neutrik XLRs

ALL SPECIFICATIONS BELOW ARE WRITTEN FOR A SINGLE TBU

ANALOGUE AUDIO INPUT SPECIFICATIONS

QUANTITY 2
CIRCUIT TYPE Electronically balanced
INPUT CONNECTORS 3 Pin XLR sockets
INPUT IMPEDANCE > 100K
INPUT LEVEL Each input selectable between Mic & Line
MIC INPUT GAIN RANGE ± 10dB
MAXIMUM MIC INPUT LEVEL (UNITY GAIN) -35dB
LINE INPUT GAIN RANGE ± 10dB
MAXIMUM LINE INPUT LEVEL (UNITY GAIN) +20dB

DIGITAL AUDIO INPUT SPECIFICATIONS

QUANTITY 1
TYPE AES3
INPUT CONNECTOR 3 Pin XLR socket
SAMPLE RATES 32 – 192KHz (internal auto sample rate conversion to 48KHz)
RESOLUTION 24 Bit
FULL SCALE = +18dBu

LEVEL METERS (PPM STYLE)

QUANTITY OF LEDS 8
RANGE PER LED 4dB
LED INDICATION RANGE +12 to -20dB
INPUT METER POINT PRE COMPRESSOR/ LIMITER
OUTPUT METER POINT AFTER GAIN CONTROL

ANALOGUE AUDIO OUTPUT SPECIFICATIONS

QUANTITY 2
SOURCE 1st output always output from telephone line, 2nd output can additionally have input mixed in with it (selectable from front panel dip switch)
CIRCUIT TYPE Electronically balanced
OUTPUT CONNECTORS 3 pin XLR plug
OUTPUT IMPEDANCE 50 Ohms
MAXIMUM OUTPUT LEVEL +18dBu
OUTPUT GAIN RANGE ±10dB

DIGITAL AUDIO OUTPUT SPECIFICATIONS

QUANTITY 1
SOURCE Output from telephone line
TYPE AES3
INPUT CONNECTOR 3 Pin XLR plug
SAMPLE RATES 32 – 192KHz (follows digital input sample rate) if no digital input the output sample rate is fixed at 48KHz
RESOLUTION 24 Bit
FULL SCALE = +18dBu

TELEPHONE LINE INTERFACE SPECIFICATIONS

QUANTITY 1
CONNECTOR RJ11 socket (6P4C)
IMPEDANCE 16 complex AC circuits suitable for use Worldwide selectable by front panel 'HEX' switch.
STANDARDS Globally compliant design implemented (FCC, NET4, TBR-21 (replaces BABT), JATE & others)
LINE ISOLATION 5000 V
BANDWIDTH 450Hz to 3.2kHz (±0.2dB)
SEPARATION (AUDIO IN to OUT) >80dB with 0dB pink noise input
LINEUP LEVEL TO/ FROM LINE 0, +3, +6dB selectable via front panel DIP switch
LINE DISCONNECT Automatic on K break (selectable)

TELEPHONE CALL CONTROL

AUTO ANSWER SELECTION Select between Off, after 1 ring or after 8 rings
HANDSET INTERFACE (handset not included) 1
RS232 INTERFACE 1
LOOP CONTROLS 8
HANDSET CONNECTOR RJ11 socket (6P6C)
RS232 CONNECTOR 15 pin 'D' socket
LOOP CONTROL CONNECTOR (on 15 pin 'D' with RS232)
HANDSET FUNCTIONS Full dial/ answer line functions
RS232 FUNCTIONS Full line control plus full set up control
LOOP FUNCTIONS On hook, Off hook/ Divert, 4 x audio switch controls,
ADDITIONAL OUTPUT Open collector output indicating on/ off hook status

FRONT PANEL CONTROLS

DIP SWITCHES 12 dip switches for full setup / configuration
HEX SWITCH 16 position switch for line impedance matching
INPUT GAIN Recessed input gain control
OUTPUT GAIN Recessed output gain control

Glen sound Hybrids - A Brief History

Around 1966 Glen sound founder, Len Davis, first designed a TBU for one of BBCs light programmes. This allowed the BBC to achieve live on air phone calls and was an exciting development.

Within a few years Glen sound TBUs were found in a number of EMX (engineer managed exchanges). By 1972 a multiple (4 channel) TBU was in use in BBC studio 3E, London. In 1975 'auto gain control' was added to the standard TBU type PA8/351, enabling consistent caller level.

By 1980 the next generation of TBUs were designed and during the 80's several hundred of this generation were in use in different formats. Around 1989 one of the last designs utilizing the Glen sound TBU was manufactured. This was called 'TRICE' (Tony Richies International Commentary Equipment).

By the start of the 90s Glen sound moved away from the TBU market to concentrate on ISDN codecs and commentary equipment.

In 2010, the Glen sound TBU was set for a comeback!



Glen sound ATOMIC Range

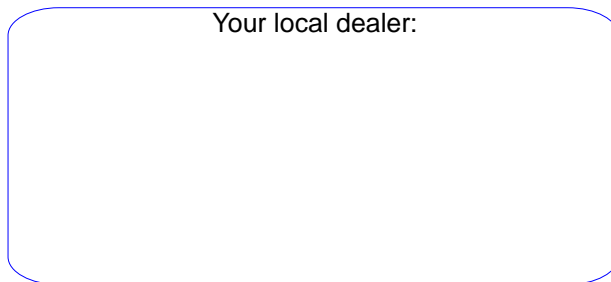
The ATOMIC Range features the key elements demanded by the modern broadcaster. Sonic integrity, the finest audio components, ease of use, and Glen sound broadcast grade reliability.

If you see the Atomic and Glen sound logo on a product, you have the assurance of a product designed with the best available technology, with the design and development expertise of Glen sound engineers who have been developing broadcast audio products since 1966.

Atomic



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