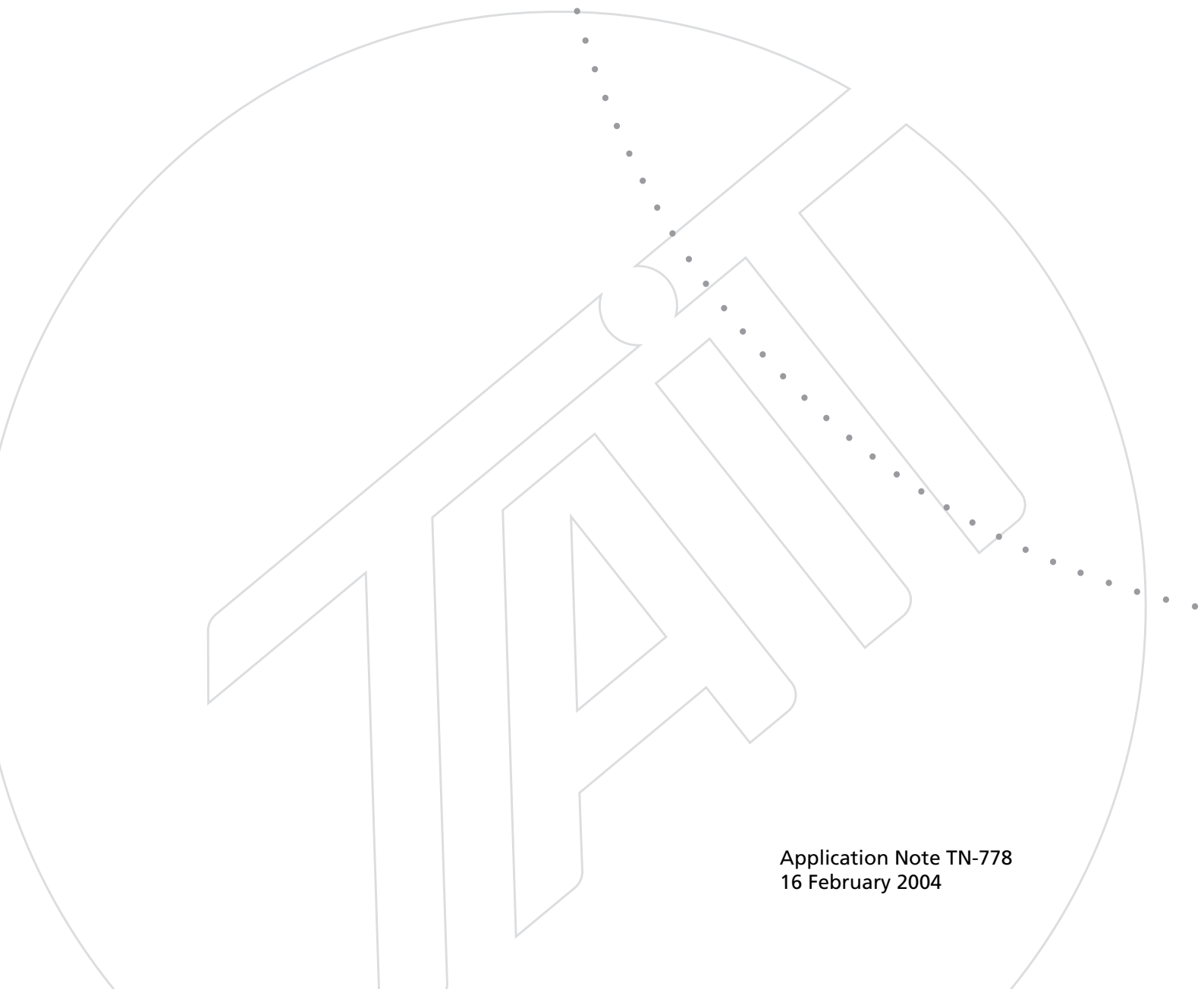




TB8100 base station

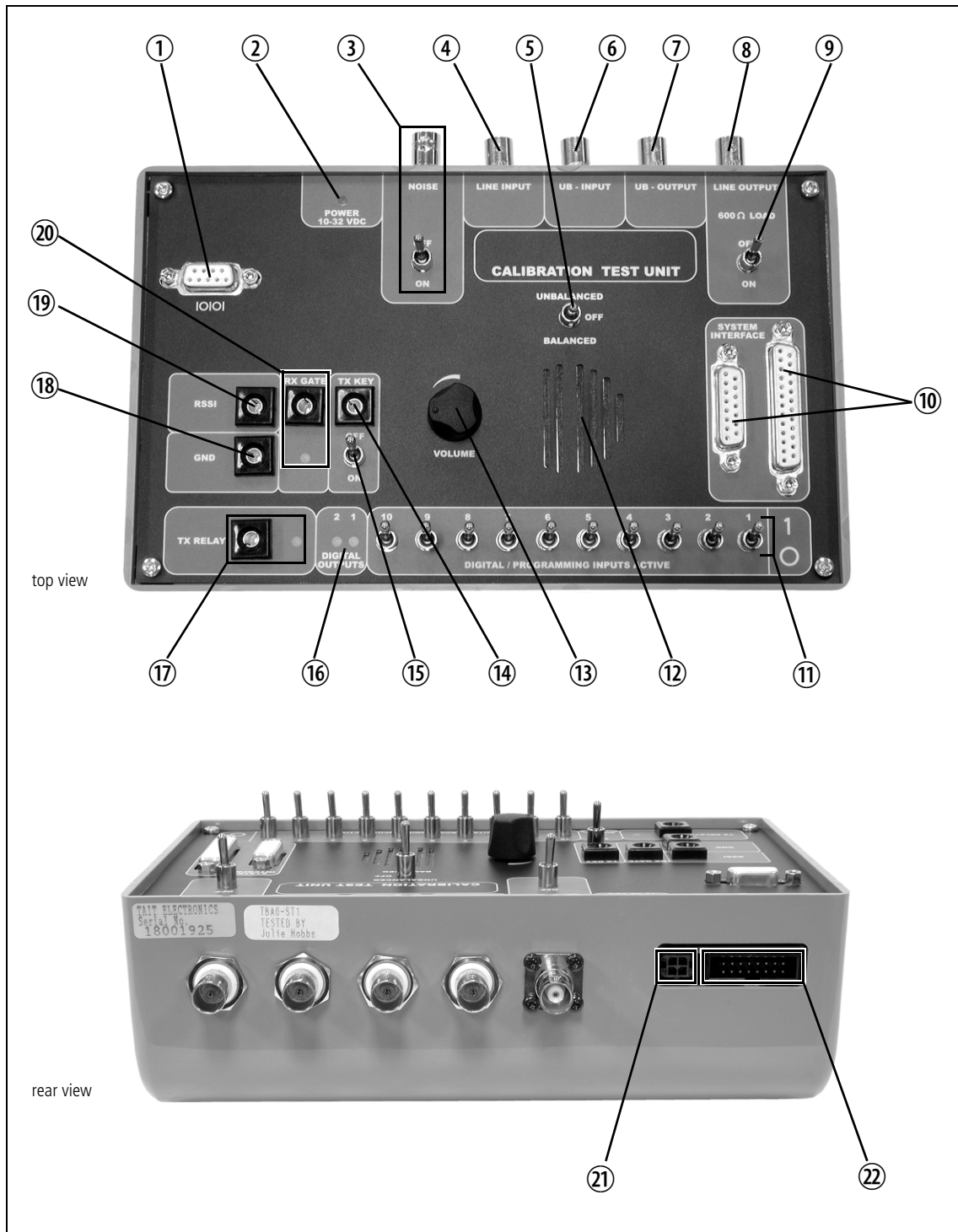
The TB8100
Calibration and
Test Unit



Application Note TN-778
16 February 2004

This Application Note introduces you to the TB8100 Calibration and Test Unit (CTU). The CTU provides a selection of inputs and outputs which allows the TB8100 base station system to be connected to standard test equipment, and also to a PC running the Service Kit or Calibration Kit software. These inputs, outputs and associated controls are identified in [Figure 1](#), and their functions are explained in the paragraphs which follow. Refer also to the block diagram in [Figure 3 on page 7](#).

Figure 1 CTU Connections and Controls



- | | |
|---|--------------------------------|
| ① programming port | ⑫ speaker |
| ② power LED | ⑬ speaker volume |
| ③ noise source output and on/off switch | ⑭ Tx Key input |
| ④ balanced line input | ⑮ keying switch |
| ⑤ speaker audio selection switch | ⑯ digital output LEDs |
| ⑥ unbalanced line input | ⑰ Tx Relay output and LED |
| ⑦ unbalanced line output | ⑱ ground connector |
| ⑧ balanced line output | ⑲ RSSI output |
| ⑨ 600Ω load on/off switch | ⑳ Rx Gate output and LED |
| ⑩ system interface connectors | ㉑ DC input |
| ⑪ digital input switches | ㉒ system control bus connector |

The CTU is designed to make it easier to program, tune or calibrate TB8100 modules. It also allows a user to monitor and control the inputs and outputs available on the reciter's system interface connector. Figure 2 shows a typical interconnection setup.

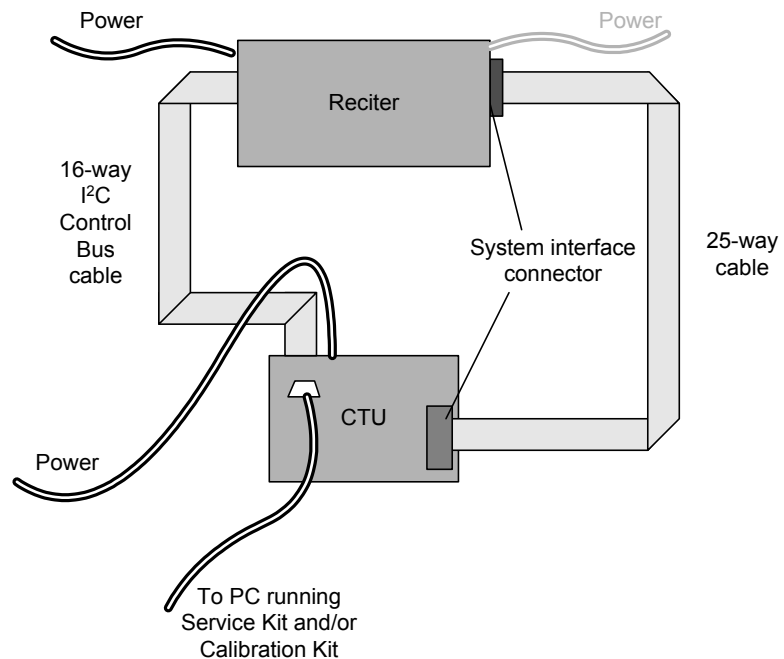


Figure 2 Example CTU Setup

Refer to the Calibration Kit documentation for details on how to use the CTU for tuning and calibrating TB8100 modules.

- ① **Programming Port** This is an RS-232 serial port which is used to connect the CTU to the PC running the Service Kit or Calibration Kit software. A control bus cable


must connect the CTU (via connector ⑩) to the reciter for this interface to work.

- ② **Power LED**
- The power LED is lit when the CTU is powered up. You can supply power to the CTU in the following ways (see [Figure 2](#) on [page 3](#)):
- connect power directly using the ②① DC input socket.
 - let the reciter provide power over the ②② system control bus connector .
 - let the reciter's system interface provide power over the ⑩ system interface connector. This requires that you connect power to the connector adjacent to the system interface.

You can safely connect power to two or more of these connectors at the same time.

Note You do not need to provide power to the CTU at all in order to make audio level measurements or to use the digital inputs and outputs. Lack of power will not affect these interfaces.

- ③ **Noise Source Output and On/Off Switch**
- The CTU's internal, wide bandwidth noise source is available on this output. It can be connected to the RF input on the reciter and used to tune the receiver's front end. The switch turns the noise on and off. The bandwidth of the noise source is approximately 50MHz to 1GHz, and the output level is approximately -130dBm/Hz. This output level is equivalent to -91dBm typical for a narrow bandwidth receiver, -89dBm typical for mid bandwidth, and -88dBm typical for wide bandwidth.
- ④ **Balanced Line Input**
- This balanced input is connected to the balanced line input on the system interface connectors.
- ⑤ **Speaker Audio Selection Switch**
- This switch directs either the balanced or unbalanced output audio to the CTU speaker. When set to "off", no audio is present on the speaker.
- ⑥ **Unbalanced Line Input**
- This input is connected to the unbalanced line input on the system interface connectors.
- ⑦ **Unbalanced Line Output**
- This output is connected to the unbalanced line output on the system interface connectors. Audio on this line can be monitored on the CTU speaker.
- ⑧ **Balanced Line Output**
- This balanced output is connected to the balanced line output on the system interface connectors. It is connected directly to pins 1 & 2 on the connectors (i.e. it is not grounded). Audio on this line can be monitored on the CTU speaker.

- ⑨ **600Ω Load On/Off Switch** This switch connects or disconnects the 600Ω load across the balanced line output. This allows the output to be terminated correctly for calibration procedures.
- ⑩ **System Interface Connectors** These connect to the 25-way or 15-way system interface connector on the rear of the reciter.
- ⑪ **Digital Input Switches** These switches are connected to the digital inputs on the system interface connectors and can be used for channel selection. The active state of the digital inputs is defined by the setting in the Service Kit software (Configure > Base Station > System Interface > Channel Selection > Invert).
-  **Note** Although the CTU has 10 switches, some system interface PCBs have fewer than 10 digital inputs. The 15-way TaitNet system interface has only one digital input. The pin allocations for each PCB are listed in the Installation Guide, Installation and Operation Manual, or Service Kit (Configure > Base Station > System Interface). Refer to the Service Kit documentation for details on how to configure external channel selection.
- ⑫ **Speaker** The CTU is fitted with a 0.5W 16Ω speaker. Audio from the balanced or unbalanced line outputs can be connected to this speaker.
- ⑬ **Speaker Volume** This controls the volume of the speaker. Rotate clockwise to increase the volume, and anticlockwise to decrease the volume.
- ⑭ **Tx Key Input** Ground this input to key the transmitter when the “Keying Switch” is in the “off” position.
- ⑮ **Keying Switch** When this switch is set to “on”, the transmitter is keyed (i.e. transmitting). When it is set to “off”, the transmitter is not keyed. When the switch is in the “off” position, applying a signal to the “Tx Key Input” will control the state of the transmitter.
- ⑯ **Digital Output LEDs** These LEDs indicate the status of the digital output lines on the system interface connectors. They are lit when the digital output lines are activated.
- ⑰ **Tx Relay Output and LED** This output is connected to the Tx Relay output on the 25-way system interface connector, and to digital output 3 on the 15-way system interface connector. The LED is lit when the output is activated.
- ⑱ **Ground Connector** This is connected to the CTU and system interface connector ground.

⑲ **RSSI Output** This output is used to monitor the RSSI output from the 25-way system interface connector. (Not available if the system interface connector is 15 way.)

⑳ **Rx Gate Output and LED** This output is connected to the Rx Gate output on the system interface connectors. The LED is lit when the receiver gate is open.

㉑ **DC Input** Connect a 10 to 32VDC power supply to this input. This supply powers the:

- noise source
- speaker
- LEDs
- RS-232 communications.

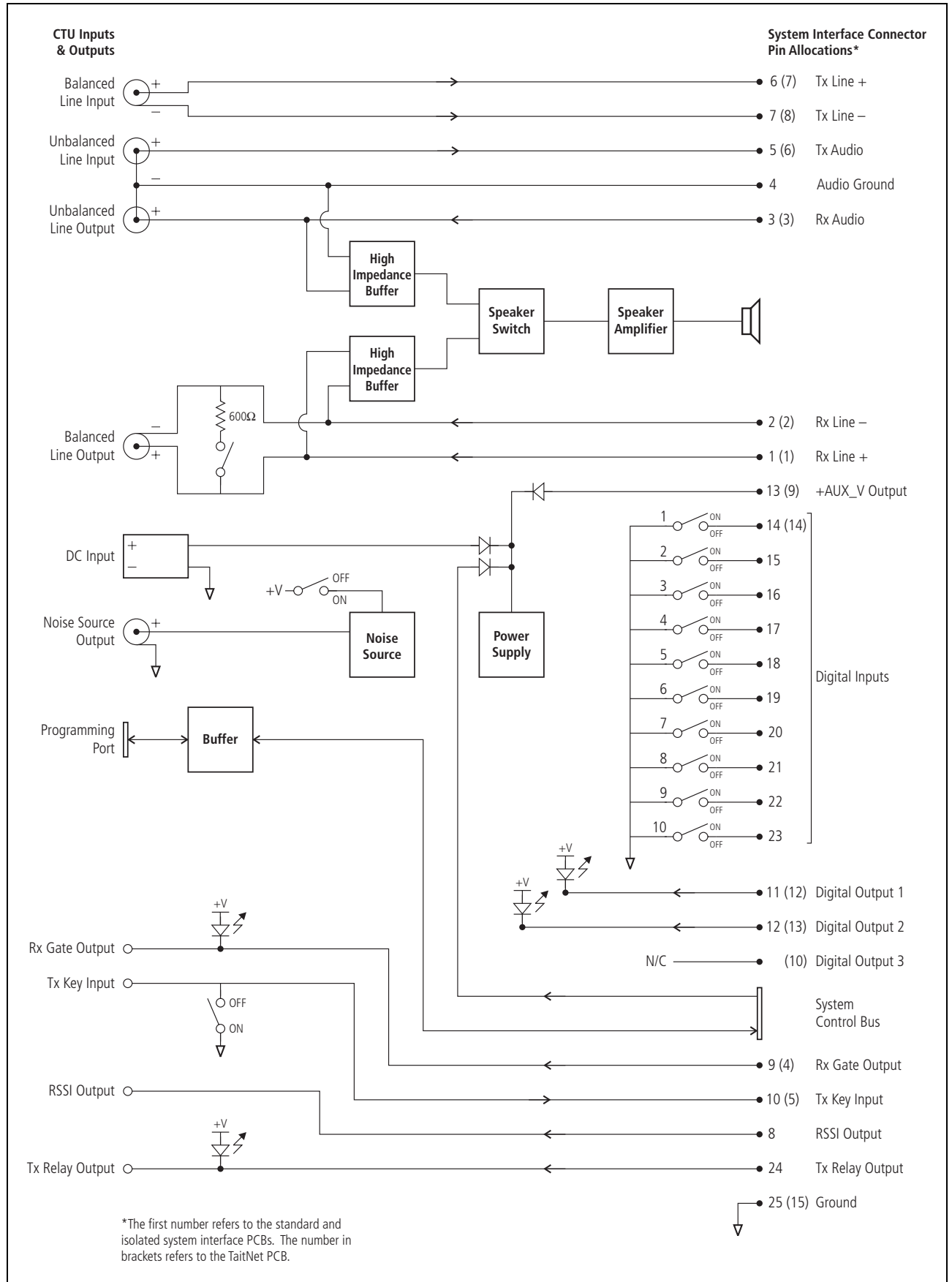
The DC input connector is not used if power is supplied via the system control bus or system interface connectors.

㉒ **System Control Bus Connector** This connects to the system control bus connector on the front of the reciter for tuning, calibration and programming. You can also calibrate a PA when it is linked to a reciter and CTU via the system control bus.



Note If you need to make your own system control bus cable, the recommended maximum length of the cable is one metre (39 inches).

Figure 3 CTU Block Diagram



Issuing Authority

This TN was issued by: John Crossland
Technical Publications Manager

Publication History

Publication Date	Author
16 February 2004	D Reynolds/L Chisholm

Amendment Record

Publication Date	Page	Amendment
16 February 2004		First release

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