



CommBox Classic & Lite User Manual

Your CommBox unit has been programmed by its installers or your support staff to suit the specific requirements of your installation.

Although it is possible for you to alter many of the settings from the menu system, be aware that a program running in the unit may intentionally reset anything you change, either immediately or when a certain event, such as the expiry of a timer, occurs. Also, control of many of the items may be possible from the user interface, eg Touchscreen,Joey, Softouch, Handset, Wallplate etc.

The SYSTEM STATUS items are primarily intended for technical support staff, service technicians and system developers. Unless you have a copy of your installation's wiring diagram and a program listing or are being asked to observe a particular occurrence by support staff, the items in this area may well be of academic interest only.

Items such as Program Volume, Microphone gains, etc may be adjusted with impunity, but be careful you understand what you are doing BEFORE adjusting the audio THRESHOLD FUNCTIONS as it is possible to get some very undesirable effects with incorrect adjustment.

Format of this Manual

We have tried to design this manual so that it can be "skimmed" for basic information, but to avoid confusion,

detailed, technical or "by-the-way" information is in boxes with a different type style like this.

As always, if you have any suggestions on how we can improve our manuals, service or product, they would be most welcome.



1. Introduction

Your CommBox unit contains comprehensive video and audio systems and a sophisticated programmable controller that may be configured via a PC to perform many and varied control tasks, the extent of which is limited largely by the imagination of the programmer.

At the heart of the CommBox is a small computer. Just like any computer, its behaviour depends largely on the software running in it. Some of the software you can't change; in this category is the software that controls the menu system.

Because any CommBox installation can be very different from another in the type of equipment connected and the way this equipment is controlled, this manual cannot hope to cover all possible installations. But the menu system is always the same regardless of the installation.

2. Familiarisation

Instead of the dozens of knobs, switches and indicator LEDs that would normally be required to operate its many facilities, your CommBox uses just one knob, two buttons and a display panel. The display panel changes to suit the function being performed.

You do two things with the knob;

- * Turn it to select menu items on the display and
- * turn it to adjust an item that you may have selected.

The display always shows you what you have selected and, if you are adjusting an item, how much you have adjusted it.

The two buttons work like this;

Press the ↵ or ENTER button to SELECT or ACCEPT what is on the display. It's like saying "Yes, I want this".

Press the ESC (escape) button to GET OUT or GO BACK from where you are. ("I've finished with this." or "Get me out of here!")



3. Organisation of the menus

Nothing in the CommBox menu system is more than two levels deep, so you won't get lost as you can with some menu systems. This means that you can always get back to the beginning by pressing ESC twice, no matter where you are.

The starting point, or TOP LEVEL as it is called, allows you to select a FUNCTION. Just by turning the knob, the CommBox functions you can observe or adjust are displayed.

If you press ↓ on one of these, you go DOWN a level, usually to a more specific item.

So, if you press ↓ when

Select Function
Program Audio

is displayed, you will get

Program Audio
Program Volume

Now you could turn the knob to select other PROGRAM AUDIO selections, but let's just press ↓ here. The display changes to the BOTTOM level

Program Volume
26

Turning the knob now adjusts this item.

So you can see that the menu system is organised like this;

- * TOP LEVEL Most general
- * MID LEVEL More specific
- * BOTTOM LEVEL Most specific - this is where we do things.



4. Using the System

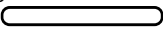
Since the menu system is so logically structured, it makes sense for us to follow this structure when explaining how everything works.

Let's go through the menu in the order in which it appears.

Select Function
Program Audio

Pressing ↓ here allows you to select from a range of adjustments that affect the PROGRAM sound, that is, the sound that might be coming from a VCR, audio cassette, Laser disk etc.

Let's say you were to press ↓ on PROGRAM VOLUME. The display changes and a horizontal bar graph appears like this:

Program Volume
26 

If you now turn the knob, the program volume, the bar and the number all change along with the knob rotation.

Note that neither this volume control nor any other PROGRAM AUDIO item affects the microphones.

The other audio functions work in a similar way, except that the BALANCE and FADE controls are **differential**, which just means that as you turn the knob, two of the audio channels go DOWN while the other two go UP.



CommBox's audio system is basically four channel. It's designed to have two sets of stereo speakers - one set in the front of the room and one in the rear. This gives great flexibility and a more even spread of sound. It also helps with microphone feedback margins in lecture theatres and such.

Don't confuse this with the four sets of audio INPUTS - it's a different issue which we'll discuss later.

For the technically minded, all the audio functions in CommBox work in 2dB steps. So, if for example, you adjust the volume from 20 to 26 you have raised the gain by 12dB.

Press ESC twice to get back to the TOP LEVEL. Then select the next item,

Select Function
Microphone Audio

This works in a similar way to the PROGRAM AUDIO, but these items only affect the MICROPHONE inputs.

Your first item is MICROPHONE GAIN. This is a master gain control for all the microphones. For convenience, it is usually set at MAXIMUM (40) and the next two items, MICROPHONE 1 LEVEL and MICROPHONE 2 LEVEL used to adjust levels as required.

Each microphone input has a separate FADE control, but the EQ controls are common to both inputs.



The microphone preamplifiers are optimised for voice pickup under mid-field conditions, that is, with a microphone spaced 30 to 90 cm. from the mouth as would occur in a lecture theatre situation. It is possible, in fact quite easy, to over-drive the digitally controlled microphone gain control system by speaking loudly into a sensitive microphone at close range or by using a line-level feed from, say, a radio mic. receiver.

You can tell if microphone channel over-drive is occurring by the fact that you will still get distortion even if you reduce the microphone gain controls.

As a guide, if you set the MICROPHONE GAIN (i.e. the mic. master) to 40 and you need to reduce the MIC 1 or MIC 2 settings to 8 or less, the potential exists for over-drive.

*Another way of looking at this is that if the MICROPHONE GAIN and the MIC 1 or MIC 2 settings, **added together**, come to 48 or less, you could be in trouble.*

To get around this problem, either use a less-sensitive microphone or insert a resistive pad of about 12dB in the microphone circuit. For lowest noise, always ensure that the pad presents a low impedance (1K ohms or less) to the microphone input.

The MICS OUT socket on the rear of the CommBox carries a line-level sum of the two mic. channels and is not affected by any gain controls.

The next menu item is

Select Function
Threshold Functions

These are the automated audio control functions. They allow the microphone and program gain controls to be adjusted automatically depending on other audio conditions. Effectively, CommBox will "listen" to, or monitor, microphones and program audio and take action to automatically adjust these if certain conditions, which you set up, are met.

Threshold Functions
Mics. Priority Level



This setting monitors the level of sound picked up by the microphones. You can set this level so that, if it is exceeded by speaking into a microphone, the PROGRAM VOLUME adjustment will be instantly cut by a value you set in PROGRAM GAIN CUT. This allows a user of the microphone to make comments over, say, the sound track of a video without being "drowned out" by the sound track.

Once speaking ceases, the program audio setting will "fade" back to its original setting at the rate of 2dB per second. So remember that the higher you set PROGRAM GAIN CUT, the longer the program audio will take to return to normal.

Threshold Functions
Set Noise Gate Level

This setting monitors program audio level. Its purpose is to automatically disable microphones when they may, because of their contribution to room reverberation, degrade audio quality during, say, video presentations or music replays.

If the value set in NOISE GATE LEVEL is exceeded, the MICROPHONE GAIN is reduced by a value set in SET MICS GAIN CUT. It does NOT return to its previous setting until a microphone is spoken into, and as a result the value set in MICS PRIORITY LEVEL is exceeded.

Note that you must set MICS PRIORITY LEVEL to an "achievable" value if you want the mics to "come back on" when spoken into.

If you want the NOISE GATE function without the MICS PRIORITY, just set PROGRAM GAIN CUT to zero.

Threshold Functions
Set Mic1 SPL Top Out

This item may be set up for each microphone input. It allows you to set a level that, if it is exceeded for more than two seconds, will cause the relevant microphone gain to be reduced until the problem is cleared. No reset to previous values occurs.

This can serve three purposes:

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A U S T R A L I A S H A N G H A I S I N G A P O R E M A L A Y S I A



- * A "last-resort" anti-feedback measure
- * Reduce nuisance value from bad microphone technique.
- * Reduce damage to speakers from the same cause.

Threshold Functions Monitor Audio Levels

Have you been wondering how you might determine the numbers to set these items at? Here is the answer.

When you select this menu item, you can monitor

Pgrm	Mics	Mic1	Mic2
00	00	00	00

The numbers that appear on this menu screen have no direct relationship to any dB values of the audio. They are relative values only, but they are the numbers used by the threshold functions.

The numbers can range from 0 to 128 but since there is only room on the display for two digits, "***" is displayed if 99 is exceeded.



These values, sampled and updated every second, allow you to determine for a given installation the values that will safely trip a threshold function in normal operation.

BUT USE CARE!

The operation of any system of this type should be unobtrusive. An uninitiated user or listener should not be aware of what is happening. The following tips should help in this regard.

- * *Keep PROGRAM GAIN CUT to no more than 6 or 7.*
- * *Keeping MICS GAIN CUT to a minimum avoids lost syllables.*
- * *Make sure that MIC PRIORITY is set above background program pickup by the microphones. Use MONITOR AUDIO LEVELS to check this.*
- * *The SPL Top Out thresholds should only be tripped in a dire emergency, because there is no provision for automatic reset unless this is written into the configuration. Set them as high as practicable or to maximum if they are not to be used.*

It is possible to get a kind of slow feedback effect, that is, a cyclic reduction of program audio or a "dropout" effect on loud passages if the microphone pick up of the audio is sufficient to trip the MICS PRIORITY threshold, so be careful not to set it too low. Remember that a user will be trying to "shout over" the audio when he trips this function.

On the other hand, setting it too high will make it appear unreliable and will be stressful to the user.

If room acoustics and bad microphone placement allow high levels of program audio pickup by the microphone, the compromise required may be unacceptable and it would be better to disable the Mic Priority function entirely rather than have to set it to too high a level and consequently have it appear to be unreliable.

If in doubt, cancel a Threshold Function by setting it to MAXIMUM, i.e. 99.

If the CommBox front panel is accessible to unauthorised people and/or there are greatly differing audio requirements in a venue and/or you are allowing the user control of microphone settings via the Touchscreen or Softouch, you might consider programming a "normalising" facility into your system. This could take the form of a macro that simply sets all the audio and threshold functions to known values. These values can be initially determined by using the front panel to obtain optimum performance. Write the numbers down on a piece of paper so that you can enter them into your configuration then download your new configuration to the CommBox.

If you are using the SPL TOP-OUT feature, a "normalise audio" key provides a means for the user to recover from accidents like dropped microphones and the type of feedback problem that you can get with lapel microphones when their pickup pattern is radically altered by being worn against acoustically reflective clothing like leather.



Select Function
Input Select

This menu item allows you to control the CommBox's internal video and audio switchers from the front panel, independently of any programmed functions and the user interface.

The main uses for this function are as an aid to diagnosis and system testing and as a backup to permit manual operation if the program in the CommBox is erased for any reason.

To use this feature, press \downarrow when INPUT SELECT is showing. If you now turn the knob, you will see;

Input Select
Inputs Off



Input Select
Input 1



Input Select
Input 2



Input Select
Input 3



Input Select
Input 4

Pressing \downarrow on any of these will select that input.

You can't select video or audio separately here as you can from within a CommBox configuration. Similarly, no automatic operation of, say, a video projector or screen will occur as these are a function of the custom configuration. If a configuration is loaded and you invoke an INPUT SELECT operation from the user interface, any previous manual operation will be over-ridden.



Select Operation
System Status

Pressing ↵ on this menu item allows you to monitor almost all aspects of your CommBox system's operation. You can also read the DOS filename and date of the currently loaded configuration so that you can be sure you have the correct file on your PC before you make changes to it.

As mentioned in the introduction, the SYSTEM STATUS items are mainly intended for technical support staff. They are all READ ONLY, which means you needn't worry about messing anything up if you find yourself in this area accidentally.

Press ↵. You should now see

System Status
Peri Switches 00-07

"Peri" is short for Peripheral Interface Unit. This is the unit that connects to the CommBox and contains the relays, switches etc. that, for reasons of electrical noise, need to be kept away from the audio facilities. This also allows signal and mains wiring to be well segregated.

You could press ↵ again to look at the state of the relays numbered 00 through to 07, or turn the knob to select more items.

Pressing ↵ gives us this screen;

Peri Switches 00-07
(-) = Off -----

if all the relays are off. If, say, 02 and 05 were on, the screen would look like this;

Peri Switches 00-07
(-) = Off --2--5--



When you are monitoring the non-isolated switches 10 to 37 remember that they are ACTIVE LOW so that, when the status display says they are ON, they will be at 0 volts.

You may notice the screen "flick" while the System Status items are being displayed. This is because it is being updated once every second so as to always reflect the current state of an item.

*If you are monitoring items in the Peripheral Interface Unit and a PIU is **not** currently connected to the CommBox, the status display will behave as though there is a PIU connected. This is consistent with the fact that non-existent hardware can still be used as flags in your configuration.*

System Status
Peri DAC O/P's 0-3

This item, and the one following, monitor the state of the Peripheral Interface Unit Digital to Analog Converters, or analog ramp output channels, of which there are eight.

Each of the eight channels may be varied, under control of the loaded configuration, to any output voltage between 0 and 12 volts in 64 steps. Channels 0 and 1 also have hardware scaling and offset controls to provide more flexibility in interfacing.

Your PIU may not be fitted with the DAC IC and earlier revision PIUs require a modification to enable this facility. However, even if the DAC hardware is not available, the DAC parameters can be used as general purpose variable storage.

System Status
User Variables 0-2

This, and the following three items, allow the state of eight User Variables to be observed.

The use to which user variables are put depends entirely on the loaded configuration. When you write or modify a configuration this facility can often be a valuable aid to "debug" it.

System Status
Current A/V Inputs



This menu item allows you to watch for changes in the state of the internal video and audio switches.

System Status
User Timers 0,1

This item and the one following are for monitoring the four timer channels.

Each of the timer channels can be loaded independently with up to 127 seconds OR 127 minutes. The display shows you what is loaded and will count down to zero accordingly. When a timer reaches zero, the instructions remaining in the macro that called it are executed and "***" is displayed for that channel.

System Status
Current Config Name

This item displays the DOS filename and date for the currently loaded configuration. This is to allow "version control", as, being human, we don't always update a filename to reflect small changes that may have been made.

Obviously, to take advantage of this feature, you should ensure that the PC you are using always has its date set correctly.

Erasing the Configuration in the CommBox

If, due to some problem with a configuration or an error occurring during a download, it becomes impossible to communicate reliably with the CommBox from the PC, it is possible to ERASE the EEPROM. When this happens, a default configuration is loaded from ROM so that some operation of the unit is still possible.

To do this, switch off mains power to the unit. Then, while holding in both front panel buttons, reapply power. A different power-on tone will be heard, and the message

Resetting Unit

will be displayed briefly.



Needless to say, you should be careful not to do this unintentionally while you are rearranging equipment, especially if you don't have a PC on hand to reload the program.