

MINELEC LTD

COLLECTOR BOOTH INTERCOM SYSTEM

Voicelink Type 61910

“Talk Thru” Intercom System

Confidentiality Notice

This manual is provided solely as an operational, installation, and maintenance guide and contains sensitive business and technical information that is confidential and proprietary to our company. We retain all intellectual property and other rights in or to the information contained herein, and such information may only be used in connection with the operation of this product or system.

This manual may not be disclosed in any form, in whole or in part, directly or indirectly, to any third party.

General Information

The Voicelink Intercom system was initially developed for use in Public Transit areas where a reliable, durable and flexible intercom system was needed to provide ‘talk thru’ communications between a Ticket Collector and a Passenger. Initially, analogue designs provided the required voice activation and switching circuits for two separate microphone inputs, however, in a number of applications, this technology proved to be too restrictive and inflexible, necessitating a complete redesign using the latest microprocessor technology.

The Type 61910, now offers a microprocessor controller that provides voice activated communications from any **three** noise canceling (window mounted) microphones, while independently compensating for fluctuating background noise levels monitored through the individual microphones. When a (user adjustable) differential audio level (that compared between one microphone level and its associated background noise level monitor) is exceeded, the associated microphone circuit is switched on for a pre-set time (user adjustable) and the audio signal (speech) present on the microphone is broadcast over an associated speaker. **Note: Not all 3 x Microphones need to be used if a Paid mic. is not fitted.**

Two of the window mount microphones are installed within the passenger area (Paid and Unpaid) and one within the Collector Booth itself. All microphones are manufactured with noise canceling features and have built-in set screw adjustment for pickup sensitivity. Individual control potentiometers are also provided on

the main control board for Threshold Adjustment, Detector Gain and Microphone Volume (speaker output) as well as Tone Control for both Inside and Outside speakers.

While two separate outputs are provided on the Main Control Unit for the Outside (Paid and Unpaid) speakers, these outputs are internally connected in parallel and utilize a common control potentiometer on the Main Control Unit (Inside Mic. Volume) in order to control the outside speaker volumes.

In general, as the internal audio amplifier has been set to provide a **fixed** amplification (from outside mic. to inside speaker), any change in microphone (pre-amp.) input level will automatically adjust the associated speaker volume.

Conversely, as there are two Outside microphones (Paid and Unpaid), each with an independent control potentiometer (Paid and Unpaid Mic. Volume), that both use a common internal Booth speaker, the system can therefore be adjusted (at commissioning) to provide different speaker levels from the two Outside microphones if ever required.

In association with the Paid and Unpaid microphone controls mentioned in the previous paragraph, the standard Type 61910 Voicelink also allows Piezo pushbutton volume adjustment of the internal Booth speaker. In addition, a “Push to Talk” Piezo button is also provided. When enabled by a DIP switch on the main control board (**not factory default mode**), this button allows the Ticket Collector to **manually** activate the internal microphone, instead of relying on the **automatic** voice activation circuit. This allows manual control over the operation of the Inside microphone at stations where Collectors prefer this method of operation. When enabled by the pushbutton, the maximum length of time that the inside microphone is turned ON following the end of conversation is controlled by the “Voice Absent” timer (user adjustable in 1 sec. increments over a period of 1sec. to 15 secs.). While conversation is still occurring, the timer is constantly being re-triggered every time either side speak.

Please note that even when the system is configured for “Push to Talk” control, when the system is activated by any Outside microphone (Paid or Unpaid), the Inside microphone is automatically switched ON as though the internal “Push to Talk” button had been pressed.

Note: To remove the front cover of the Voicelink enclosure the two ‘LID SNAPS’ must first be removed to gain access to the four stainless steel cover screws. These screws are captive screws and need not be fully removed. To remove the ‘LID SNAPS’ insert a small flat bladed screwdriver into the corner recess of the ‘SNAP’ and gently lift. Replace the ‘LID SNAP’ when replacing the cover.

Contents

Installation	Page 4
Operations	
Basic Operation	Page 11
Switches & Adjustments	Page 12
Potentiometer Settings	Page 13
On-Site Adjustments	Page 14
Basic Adjustment Review	Page 15
Setting Up Procedure	Page 16
Fault Finding	Page 18
Addendum	Page 20
Wiring Terminations	
Basic Layout Diagrams	
Switch & Pot. Layout	
Warranty	Page 21

Installation

The supplied assemblies consists of:

- 1 x Main Control Unit c/w receptacles (glands)
- 2 x Speaker/Mic. Connection Box
- 1 x Switch Box c/w Push to Talk and Volume buttons
- 2 x Noise Canceling Microphone c/w 5" radius curved stem
- 1 x 120v/12vac Power supply
- 1x PKT. Accessories consisting of:
 - 2 x Outside Mic. Boss c/w blank insert
 - 1 x "Speak Here" window labels
 - 1 x Installation Manual

1. Ensure all components are included in the supplied triwall box. **Be careful to handle the microphone stems with care. These are thin walled brass tubes and can be easily bent.** If accidentally bent, lie straight section of stem on a flat surface and roll. Minor on-site adjustments may be necessary when aligning Unpaid and Inside microphone stems due to stress relief of the tube after applying the 5" radius. The stem tubes have been supplied in a standard length.... these will need cutting to length on site with a tube cutter once the exact mounting height has been determined.

With reference to the enclosed "Proposed Layout" drawing, remove the Inside Stainless Window Box front cover and accurately align the microphone and box in a vertical plane, as near as possible to the center of the Ticket wicket, bearing in mind the need to drill through the countertop for the Speaker/Mic. cable. The Unpaid and Collector Booth stems are designed to be mounted "back to back" so the correct orientation prior to installation is critical for aesthetic appearance. In general, the exact location will depend upon the physical layout of each stations Booth equipment and also on which side of the Booth passengers enter, but if possible, locate the curve of the microphone stem away from the passenger. The Microphone should be located as close to the center of the Collector window as possible and at a height that accommodates the majority of passengers who will use the equipment. This will be typically in the range 54"-56" above floor height. Once again, the exact location will differ from station to station in accordance with the location of any existing equipment and or floor height. The design criteria of this style of microphone is quite intentional, being both noise canceling and directional. Both criteria are intended to reduce and eliminate wherever possible background noises emanating from adjacent passengers or exit doors, in order to reduce spurious switching of the equipment.

The overall intent is to locate the microphone in a position that allows the passengers to speak directly into the microphone.

2. Hold the window box against the glass in its intended location, and once satisfied with the position (and suitability of drilling), accurately mark the position of the center of the 3/8" dia. hole (located in the bottom of the window box) on the countertop (this will be the location of the hole to be drilled through the countertop for the Inside Speaker/Mic. cable). The Inside mic. stem fits into the rubber grommet as supplied and can be recessed part way into the grommet if required to lower the mounting height. Note however, that depending upon the required height, it will be necessary to cut the pipe length and then re-insert it into the grommet. The length of the supplied cables on both curved microphones will need trimming to a suitable length and we have supplied sufficient crimp terminals to connect these cables directly onto the terminal strip inside the Speaker/Microphone Box.
3. Once the location of the Inside (Unpaid) drill hole center has been determined, align the Outside speaker/mic. box in the same manner and mark the center of this hole. These two drill holes **should** line up and allow both the window boxes and all mic's, stems and bosses to be mounted back to back.
4. The hole drilled in the countertop should allow the Belden cable (from the control unit) to pass through the countertop without obstruction.
5. Once these holes are drilled, remove the mic. stems from the Inside and Outside window boxes and then using silicon adhesive, attach the window boxes to the glass, ensuring both vertical and horizontal alignment of the boxes. Both boxes should be mounted back to back on either side of the glass.

Note 1:

When mounting the window boxes allow sufficient room to fit the speaker cover to the box without interference from the countertop. The front cover is a ‘wrap’ around cover and therefore the bottom edge of the box should not be totally flush with the countertop. Most large glass windows use a metal ‘thresh bar /channel to secure the glass to the countertop, therefore this ‘obstruction’ should be considered when initially mounting and aligning the window boxes and drilled hole.

Note 2 : The Paid Speaker//Mic. installation is identical to the Inside and Outside (Unpaid) speaker/mic.

Hint - It can be most useful to use a piece of cutoff mic. stem (say ½” – 1” long) and to fit this into the 3/8” dia. hole in the bottom of the window box. If the hole in the countertop is also drilled to accept the 3/8” pipe (eg. 3/8” deep), this will provide a suitable support and cable protection should it be necessary to ‘elevate’ the window box to overcome a glass ‘thresh’ bar/channel.

6. Having mounted the window boxes, leave them to set for a while.

7. Mount the Switch box in a suitable location that allows the Ticket Collector easy access to both switches. Note that cable access in this box has been designed for top entry only. This ensures the label is correctly orientated. Note: The Switch Box uses Piezo pushbuttons for both “Volume” and “Talk” functions and they require a firm push to operate. While there are NO moving parts in these switches, body capacitance MUST be transferred to the switch in order for it to activate, therefore, greater sensitivity is provided when a firm push is given and the user is not touching any other part of the box. The “Volume” pushbutton is included to allow the Collector to decrease the broadcast level of the Inside speaker. Following initial power ON, the first press of the button automatically REDUCES the speaker level to the minimum value then any additional Press of the button will increase the volume. The “Volume” button has also been provided with a simulated tactile feedback circuit that broadcasts an audible “click” over the Inside speaker. The level of this audible “click” is proportional to the increase/decrease in volume level being adjusted. If the “Volume” pushbutton is pressed, the Inside speaker volume will increase and the “click” level also increases.

Note: As dispatched from the factory, the DIP switch settings are such that the TALK button has NO effect on the operation of the internal microphone.

8. Install the Voicelink controller box and power supply, however at this stage do not plug-in. Install the AC power adapter using suitable cable and terminate this onto the appropriate power terminals. (The inside of the voicelink front incorporates a wiring, control and termination diagram).
9. Having left the window boxes to set for a while (1 hour or more depending upon the type of silicon used), the appropriate curved stem microphones can now be installed on the windows.
10. Carefully clean the window where the Microphone Stem Bosses will be installed. Then remove the chrome window boss and blank plug from the accessory packet and loosely fit this to the microphone stem. These assemblies are intended to assist in supporting the chrome microphone stem/assembly to the glass window. Note however that the Window Boss assembly should be located over the groove in the mic. stem (these grooves are designed to accept Alarm LED wiring to be installed through the boss (not supplied with this version). Note that both the Window Boss (outside) and the Window Boss (Inside) assembly will be mounted back-to- back. The design of both styles of Window Bosses, automatically adjust the microphone stem to be a similar distance off the glass as the microphone holder itself.
11. Tape the Unpaid Area Window Boss and the Unpaid Microphone assembly in position on the window
12. The Microphone Boss and the Chrome Window Boss are finally attached to the glass using Silicon sealant. When the Unpaid microphone is ready to be fixed, pre-cut 4” strips of electricians tape and locate them within easy reach of the final position of the Bosses. These strips will be used to hold the microphone assembly in place while the Silicon sealant sets.
13. Apply a dab of clear silicon to the center of the rear of both Mic./Window Bosses (slightly less than the size of a dime). **The intent is to locate and press both window bosses to the glass at the same time using a minimum of pressure that will allow the silicon to exude from behind the boss and form a small circular bead around the entire boss.** Great care MUST be taken with initial alignment and subsequent applied pressure in order to achieve a uniform fix and also to achieve aesthetic acceptability. Silicon sealant is not easy to remove while in a “fluid” form if one makes an error and will take approximately 45-60 mins to set sufficiently well to maintain the final assembly. Have a helper apply the pre-cut lengths of tape in order to hold the Window Bosses and stem to the glass BEFORE you release the items while the silicon sets. Ensure that the tape is secure and that slippage of the assemblies will not occur.

Depending upon installation preference, it may be easier for the inexperienced installer to first install the INSIDE microphone stem, and then to install/align the Unpaid Side microphone assembly and window Boss to perfectly match the installed position of the Inside Bosses. This will eliminate any inaccuracies in alignment as the Unpaid window Boss can slide up/down the mic. stem which in itself can slide through the rubber grommet to the exact position. Be sure that the Inside stem is mounted at a height so that the Outside stem can be aligned to match this. Installing the first one too high can lead to problems with aligning the second. Also note that if too much stem protrudes into the speaker/mic. box assembly, this can interfere with the fitting of the speaker cover and will have to be removed. Carefully check that no more than ½” of stem protrudes into the speaker /mic box.

14. The Inside microphone stem is installed in a similar manner.
15. As mentioned above. fit the boss over the stem and re-insert the stem into the window box grommet adjusting the height to match the Unpaid (outside) boss positions. Note: When adjusting the stem height, again be sure that the stem will not interfere with the speaker when the front cover is replaced. While adjustment is possible, only a limited amount of vertical height adjustment is possible without cutting the stem. .
16. If cutting is necessary, once the stem is marked for the cut, use a tube cutter to carefully cut the tube. In order to release the two separate tubes after cutting it is necessary to first remove the “tube plug and cap” installed in the bottom section of the tube. **This “tube plug and cap” are important components in aiding noise canceling features and must be replaced after removal!**
17. Carefully slide the “tube plug and cap” assembly down the wire ensuring that no undue strain is imposed on the microphone wiring itself. Once removed, the lower section of the cut tube can be removed.
18. Carefully re-assemble the “tube plug and cap”, fitting BOTH the microphone wires through the silicon plug. Slide the “tube plug and cap” into place in the bottom of the lower section of the tube.
19. Install Window Bosses to the glass as per paragraph 13 above, using clear silicon sealant and tape strips.
20. Once the applied silicon has set, carefully fill the Unpaid Window Boss holders with silicon and press in the blank cover button. Ensure that no excess silicon is exuded and the button can be held in place with a tape strip until the silicon has set if required.

21. With all microphone stems installed, terminate all required wiring to the appropriate terminals in the window boxes. These boxes allow for five (5) terminals – two (2) for microphones, two (2) for speaker the one (for Alarm LED if used). The common of the speaker and the common of the Alarm LED are connected to the same terminal. The Box also incorporates a ground stud to which the shield of any of the cables should be connected. This will reduce unwanted noise pickup that may be injected into the microphone cable due to adjacent electronic equipment.
22. Connect an appropriate Belden 2 pair cable to each Window/Mic. Box and terminate this onto the **appropriate** Voicelink control connections using the supplied crimp connections. The main voicelink pcb. also has identification marks silk screened onto the surface.
23. Connect a Belden 2 pair cable to the Switch Box and terminate this onto the appropriate Voicelink pcb connections.
24. Install the supplied ‘Speak Here’ label on the Booth glass. These are reverse mounted (installed from Inside the Collector Booth to eliminate external vandalism) above the microphone heads. Be careful to accurately align the label to be centered over the microphone housing and to be horizontal with the countertop.

Note: The Polycarbonate housing used for standard Voicelinks includes Black compression glands suitable for use with the appropriate Belden cable.

25. Refer to the Setup Section for further information on installation.

Operation

Basic Operation

The Type 61910 version of Voicelink is microprocessor based and its software program ultimately determines its operating functions. The microprocessor samples each analogue signal from all microphone inputs every 850uS and converts these samples to individual digital values, which are then stored in the microprocessor RAM. These stored values are processed to provide 'background' analogue levels. These levels will change if anyone is speaking into a particular microphone or if the associated background noise itself changes.

The analogue levels set by potentiometers RV1, RV2 and RV3 are also converted and stored as digital values every 850uS. These values are the 'Threshold Offset' values, which are added to the background level values during execution of the program. A microphone input level **MUST** exceed the sum of these two levels in order to switch the appropriate VOX circuit on.

The value of any one microphones audio sample is compared with the its associated 'background' level and if it exceeds the background level by an amount greater than the 'Offset' value, the microphone will switch on for a period set by the 'Hold Timer'. The actual level of microphone signal, that will be sufficient to switch the system on, will therefore vary depending on the level of background noise.

Only one microphone can be switched on at any one time and when the SW1/1 Talk Switch dip is set to disabled, the system works on a 'first come - first served' basis. This means that the first person to speak will hold the system for a period of time set by the 'Hold Timer'. While that person is speaking, this timer is continually reset so that the person 'holds' the circuit while they are speaking. After they have stopped speaking and when the 'Hold Timer' expires, the system reverts to its idle state and waits again for a microphone to become active (exceed the 'Offset' value). During the active state, the sampling of the microphones on the opposite side are suspended so that the broadcasting speaker does not interfere with the ambient noise level readings on that side.

The operation of the system **CAN** be changed to 'Talk' switch operation by enabling the 'Talk' switch bit of the dual-in-line (DIL) switch SW1 (and re-powering the unit). In this mode of operation (not the factory default mode), the Inside microphone is normally off and not VOX switched. This means that any amount of noise (even speech) **inside** the collectors booth will not switch on the microphone UNTIL the collector presses the 'Talk' button. Each time the button is pressed, the Inside microphone will override the Outside microphone for the time period set by the hold timer. Normal VOX conversation can then occur once the timer expires. If the system detects that there has been no detected speech at any microphone for the period set by the 'VA timer' (Voice Absent Timer), the system reverts

back to its non-VOX switched mode ie. the Inside microphone MUST be activated by the “Talk” button.

Unless the ‘Talk’ button and DIL switch have been activated, at all times both microphones are VOX switched and broadcast detected speech in any direction.

Whenever the TALK button feature is activated, this has the effect that while the Inside microphone is switched OFF, a customer talking into the Outside microphones will cause the Outside mic. to operate in VOX (Voice Operated)mode. The operator responds by pressing the ‘Talk’ switch to communicate.

The broadcast level of the Inside speaker can be controlled by the operator. The volume of the on-board audio amplifiers is processor controlled. By pressing the ‘Volume’ button, the **Inside** speaker volume can be changed. When first powered up, the Inside speaker volume is switched to a level set by the on-board volume potentiometer (max. volume setting). The first press of the volume button reduces the volume to a minimum setting. Subsequent presses gradually increase the volume back to maximum.

When the volume button is pressed the Inside speaker issues a short tactile ‘click’, the volume of which depends on the actual volume setting. The operator can therefore set the speaker output level even when there is no speech signal from the outside mic..

The unit continually monitors the Outside microphone level as well as background noise levels and will adjust the microphone sensitivity accordingly.

SWITCHES AND ADJUSTMENTS

The timer settings and operating mode are configured using SW1 on the printed circuit board. The microprocessor unit reads these switches when first powered up. Subsequent changes to these require that the unit is switched off and powered up again.

DUAL IN LINE (DIL) Switch Positions

SW1/1	Talk Switch Mode	Enabled –closed, Disabled – open
SW1/2	Hold Time	0.5s
SW1/3		1s
SW1/4		2s
SW1/5	Voice Absent	1s
SW1/6	Timer	2s
SW1/7		4s
SW1/8		8s

The default settings for the system are:

1. Talk switch disabled
2. Hold time = 1s
3. VA timer = 10s

POTENTIOMETER SETTINGS

A) ADJUSTMENTS WHICH CONTROL SWITCHING

The following potentiometers set the Offset Value.

- RV1 Input 1 (Inside microphone) threshold offset adjustment
- RV2 Input 2 (Outside microphone) threshold offset adjustment
- RV3 Input 3 (Outside microphone) threshold offset adjustment

The following potentiometers set the absolute amplitude of the microphone signal entering the sample and hold circuit.

- RV8 Input 1 (Inside microphone) detector gain
- RV9 Input 3 (Outside microphone) detector gain (use if a second outside mic. input is required)
- RV10 Input 2 (Outside microphone) detector gain

B) ADJUSTMENTS WHICH CONTROL AMPLIFIER LEVELS

The following potentiometers adjust the audio level from the microphone to the associated amplifier output.

- RV7 Input 1 (Inside microphone / Outside speaker volume)
- RV6 Input 2 (Outside microphone/ Inside speaker volume)
- RV5 Input 3 (Outside microphone / Inside speaker volume)

The following potentiometers adjust the tone of the associated amplifier.

- RV11 Inside speaker tone
- RV12 Outside speaker tone

INDICATIONS

When power is first applied to the unit, the processor will scan the state of the on-board DIL. switches and will display them in sequence on LED's D12 – 16 as follows:

LED	D12	D13	D14	D15	D16
1. Talk Sw.en/dis	sw1	-	-	-	-
2. Hold timer	sw2	sw3	sw4	-	-
3. VA timer	sw5	sw6	sw7	sw8	

LED 'on' indicates the switch is closed.

When the processor is running LED D16 will flash approximately twice per second and the functions of D12 to D15 changes as follows:

- D12 Indicates when Outside (Unpaid)microphone is active and switched to the Inside speaker.
- D13 Indicates when Outside (Paid) microphone is active and switched to the Inside speaker.
- D14 Indicates when the Inside microphone is active and switched to the Outside speakers.
- D15 Indicates when the volume button is pressed (pulses)

ON SITE ADJUSTMENTS

The unit has been set with default settings and adjusted at the factory and should not require any further adjustment. However, if it is required to change the mode of operation or make adjustments to suit on-site conditions the following procedure should be used.

1. Select the required mode of operation and set the timer values on switch 1

EXAMPLE set Hold time = 3 seconds - close bits 3 and 4

EXAMPLE set VA time = 5 seconds –close bits 5 and 7

Having set the new values, plug in the power adapter to power up the unit.

At this point review the next section “Basic Adjustment Review”. This section provides a more detailed adjustment procedure than paragraphs 2, 3, 4, 5 & 6 below.

2. *If it is found that a microphone is picking up unwanted speech it is best to first adjust the noise canceling characteristics of the microphone. Each microphone has three tapped holes near the point where the stem enters the mic. holder. The outer 2 holes are fitted with grub screws at the factory. Removing one or both of the grub screws will decrease the sensitivity of the microphone.*
3. *If is found that a microphone is not sensitive enough it is best to first try increasing the detector gain by adjusting either RV8, 9 or 10. The reason for adjusting the gain first is that adding a third grub screw to the microphone will make it non-noise canceling.*
4. *It should not be necessary to adjust RV1, 2 or 3.*
5. *When the unit is powered up the speaker volume is automatically set to maximum. Adjust RV5 (Paid microphone) and RV6 (Unpaid microphone) to give a comfortable maximum level on the Inside, and one that will not cause feedback when the door is open. Operation of the ‘Volume’ switch will allow control of the inside speaker volume.*

6. *Adjust RV5 to give the required speaker volume on the Outside speakers when talking into the Inside microphone.*

Basic Adjustment Review

It may be easier to understand the operation of the controls if one considers the operation of the potentiometers as follows:

Mic. Pots: - the Mic. volume pots. are ONLY provided to allow control of the mic. signal levels going into the amplifier that drives their own associated speaker. ie. both 'Outside' mics. can be independently adjusted to broadcast a different volume level over the same internal speaker if required.... while there should be no real practical reason to do this, the fact that each mic. has its own "level" control allows each to provide a different input signal to the speaker amplifier, therefore independent broadcast volume levels are possible. While these potentiometers act as speaker adjustments, in reality they only control the output level from the microphone amplifier circuit and not the output from the actual speaker amplifier circuit.

In bulkhead or ceiling mount speaker installations, as one speaker is normally used on the 'inside' of the Ticket Booth to broadcast audio from two independent 'Outside' microphones, it provides greater system flexibility to independently adjust the microphones themselves, rather than only have one level control from the speaker.

Likewise the 'inside mic. volume' pot. ONLY controls the broadcast level to the amplifier connected to the outside speaker (s).

Detector Gain Pots:

Each 'detector' gain potentiometer independently 'conditions' the background noise signals monitored by each mic. in order to provide a more 'workable' signal that we can use for digitizing (for input to the processor). Low level signals found in quiet environments may produce a small 'course' signal that is difficult to work with and which provides insufficient resolution. By providing an adjustment on this signal we can 'scale' the monitored levels accordingly.

Threshold Offset Pots:

Threshold offsets are 'scaled' analogue voltage offset levels that are added to the average background signal monitored by each microphone. All microphones have their own offset controls so each can be different if required.....although not usually. These offsets determine at what point above the average background

noise level that a signal (hopefully speech) is allowed to turn on the processor audio switch and transmit to the appropriate speaker amplifier. As previously mentioned in low background noise situations the offset is often set low, while in high noise situations the offset would need to be increased, as high noise would usually have some sharp peaks in its waveform that one doesn't want to cause the audio switch to turn on. The intention is to set the offset control at a setting just above the 'high background noise peaks' so these don't switch the audio switch on, but at the same time, the setting has to be below a level that is provided by normal voice signals that cause the audio switch to turn on.

SETTING UP PROCEDURE

The blue potentiometers have an arrow head molded into the white screw driver slot. The potentiometer positions are given as if the arrow is the hour hand of a clock with the unit horizontal.

Note. Pot. RV8 is orientated 180 degrees to all other pots. Therefore the relevant arrow position on this pot. is rotated 180 degrees from all other pots. when viewed in the horizontal viewing position.

Before switching the power on, set the microphone volumes to a low level by turning RV5 (Outside paid volume), RV6 (outside unpaid volume), and RV7 (inside volume) fully clockwise and then turning them anti-clockwise by about 5 degrees.

Switch on power.

Speak into the inside microphone and check that LED D14 flashes on when speaking but is off when not speaking. If the LED does not come on with speech, turn RV1 fractionally anti-clockwise (only a very small turn of this potentiometer is required. If the LED is on all the time turn RV1 fractionally clockwise until it just goes off. (The position of this potentiometer should be at about 6 o'clock).

When the LED D14 is switching correctly adjust RV7 (inside mic. vol.) to give the required volume on the outside speakers.

Speak into the Outside (unpaid) microphone and check that LED D12 flashes on when speaking but is off when not speaking. If the LED does not come on with speech turn RV2 fractionally anti-clockwise (only a very small turn of this potentiometer is required. If the LED is on all the time turn RV2 fractionally clockwise until it just goes off. (The position of this potentiometer should be at about 6 o'clock).

When the LED D12 is switching correctly adjust RV6 (unpaid mic. volume) to give the required volume on the inside speaker.

Speak into the (outside) paid microphone and check that LED D13 flashes on when speaking but is off

when not speaking. If the LED does not come on with speech turn RV3 (threshold offset) fractionally anti-clockwise (only a very small turn of this potentiometer is required. If the LED is on all the time turn RV3 fractionally clockwise until it just goes off. (The position of this potentiometer should be at about 6 o'clock).

When the LED D13 is switching correctly adjust RV5 (paid mic. volume) to give the required volume on the inside speaker.

The microphones should now be set up to give the correct performance. It should not be necessary to adjust the detector sensitivity (RV8, 9 and 10). Note reference above to pot. RV8 orientation and screw position.

RV 11 adjusts the inside speaker tone and RV12 the outside speaker tone. These can be set to give the required tone but are normally set to about the 3 o'clock position (mid point).

When factory set the potentiometers should be in the following approximate positions:

RV1	6 o'clock
RV2	6 o'clock
RV3	6 o'clock
RV5	7 o'clock
RV6	7 o'clock
RV7	7 o'clock
RV8	9 o'clock (this potentiometer is oriented 180 degrees to all others)
RV9	3 o'clock
RV10	3 o'clock
RV11	3 o'clock
RV12	3 o'clock

COMPLETION OF SETTING UP

Having tested the system by standing within 2 feet of each microphone and speaking and checking that you are heard on the other side of the counter, secure the microphone caps. These can be secured by rotating OUT any remaining grub screws in the microphone cap. Close the control box and secure with the four fixing screws and screw cover panels.

FAULT FINDING

The following voltages should be measured at the test points with respect to TP11:

TP1	5.0 VDC	+/- 0.1V	Processor supply
TP2	18.5 VDC	+/- 0.5V	Amplifier supply
TP7	2.5 VDC	+/- 0.2V	Vref
TP10	5.0 VDC	+/-0.1V	Analogue circuit supply
TP4	3.0 VDC	+/-0.05V	Offset input 1
TP5	3.0 VDC	+/-0.05V	Offset input 2
TP6	3.0 VDC	+/-0.05V	Offset input 3

FAULT – NO INDICATIONS ON BOARD

If D16 does not flash check the power supply voltages as shown above. If there is no power on the board check the AC voltage on J3 and J4. This should give a reading of approximately 14.5VAC. If the ac voltage is present, check fuse F1 which is a printed circuit board mounted fuse.

FAULT – NO SOUND FROM ‘INSIDE’ SPEAKER

Check that the volume control is not set to minimum. Press the volume button several times and check that the ‘click’ can be heard. If no sound is heard, is D16 flashing? If not, check power supplies.

If D16 is flashing but no sound is heard check the speaker wiring.

If the ‘click’ is heard on the speaker, but no voice comes over check that D12 or D13 light when speaking into the corresponding microphone. If they do, check the settings of RV5 and RV6. If not check the microphone connections.

FAULT - NO SOUND FROM OUTSIDE SPEAKERS

Check that D14 lights when speaking into the corresponding microphone. If it does, check the settings of RV7. If D14 does not light check the microphone connections on Input 1.

FAULT – VOLUME SWITCH DOES NOT WORK

Check that D15 flashes when the volume button is pressed (NOTE THE BUTTON MUST BE PRESSED AND NOT JUST TOUCHED). If not, check that the voltage measured across the switch leads is 5.0 VDC +/-0.2V. If this voltage is not present check the wiring from the unit to the switch. If the voltage is present, replace the switch and check the operation again.

FAULT – SPEECH IS ‘BROKEN UP’ WHEN BROADCAST ON SPEAKERS

This fault is due to an incorrect setting of the hold timer. Try increasing the hold time by 1 second (don't forget to re-power the unit after changing the switch settings!).

FAULT – INSIDE MICROPHONE WILL ONLY WORK AFTER SOMEBODY SPEAKS FROM OUTSIDE.

Check that the ‘Talk’ switch has not been enabled on the printed circuit board switch (SW1). Make sure the switch SW1/1 is ‘open’.

Warranty

Equipment. Minelec Limited warrants for a period of one (1) year from the date of shipment, that any Minelec Limited equipment supplied hereunder shall be free of defects in material and workmanship, shall comply with the then-current product specifications and product literature, and if applicable, shall be fit for the purpose specified in the agreed upon quotation or proposal document. If (a) Seller's goods prove to be defective in workmanship and/or material under normal and proper usage, or unfit for the purpose specified and agreed upon, and (b) Buyer's claim is made within the warranty period set forth above, Buyer may return such goods to Minelec Limited, freight prepaid, at which time they will be repaired or replaced, at Seller's option, without charge to Buyer. Repair or replacement shall be Buyer's sole and exclusive remedy, and the warranty period on any repaired or replacement equipment shall be one (1) year from the date the original equipment was shipped. In no event shall Minelec Limited's warranty obligations with respect to equipment exceed 100% of the total cost of the equipment supplied hereunder.

Buyer may also be entitled to the manufacturer's warranty on any third-party goods supplied by Minelec Limited hereunder. The applicability of any such third-party warranty will be determined by Minelec Limited.

Services. Any services Minelec Limited or their authorized Service Center provides hereunder, whether directly or through subcontractors, shall be performed in accordance with the standard of care with which such services are normally provided in the industry. If the services fail to meet the applicable industry standard, Minelec Limited will, for a period of one (1) year from the date of completion, re-perform such services at no cost to Buyer. Re-performance of services shall be Buyer's sole and exclusive remedy, and in no event shall Minelec's warranty obligations with respect to services exceed 100% of the total cost of services provided hereunder.

Warranty Periods. Every claim by Buyer alleging a defect in the goods and/or services provided hereunder shall be deemed waived unless such claim is made in writing within the applicable warranty periods as set forth above. Provided, however, that if the defect complained of is latent and not discoverable within the above warranty periods, every claim arising on account of such latent defect shall be deemed waived unless it is made in writing within a reasonable time after such latent defect is or should have been discovered by Buyer.

Limitations / Exclusions. The warranties herein shall not apply to Minelec or its authorized Service Centers if any damage to the goods or failure of the services supplied hereunder, are caused by Buyer's neglect, failure to follow operational and maintenance procedures provided with the equipment, or the use of technicians not specifically authorized by Minelec to maintain and or service the equipment.

WARRANTIES AND REMEDIES CONTAINED HEREIN ARE IN LIEU OF AND EXCLUDE ALL OTHER WARRANTIES AND REMEDIES, WHETHER EXPRESS OR IMPLIED BY OPERATION OF LAW OR OTHERWISE, INCLUDING ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Return Policy

If the equipment requires service within Canada, contact MINELEC LIMITED for a return authorization number (RAN). Equipment should be shipped prepaid to Minelec Limited with a return authorization number and a purchase order number. If the equipment is under warranty, repairs or a replacement will be made by Minelec Limited in accordance with the warranty policy set forth above. Please include a written explanation of all defects to assist their technicians in their troubleshooting efforts.

Call 1-905- 828 1610 and ask for the Minelec Service Desk