

## V-136RTHF 36 ZONE TALKBACK INTERCOM/ PAGE CONTROL UNIT

### GENERAL

The V-136RTHF is a single-path dial select microcomputer controlled intercom and page control unit used with a 1A2 key system or a PABX trunk port to provide 36 zones of handsfree talkback paging.

The V-136RTHF control unit has received an FCC type KX registration; designed to be used with FCC registered Key Telephone Systems. In accordance with FCC rules with applicable tariffs, this Paging Unit may only be installed with the authorization of the host system. Installations may be made by Valcom, Inc., an authorized agent of the same, equipment manufacturers, telephone companies, registered telephone refurbishers, and those qualified for installation of FCC registered systems under FCC Rules Section 68.215. The FCC Registration Number, BAF9I7-69358-KX-N, will be listed in the affidavits filed with the telephone company; it will also be recorded in the system log kept by installation and maintenance personnel. The local telephone company is to be notified when this intercom unit is installed.

### SPECIFICATIONS

#### Features

- 36 zone
- Dial tone
- Ringback tone
- Single or double signaling
- Combination rotary/tone
- Last number dialed rering
- Dial/rering tone mute
- Mixed bell and buzzer operation
- Mixed one-way page and bell or buzzer operation
- Mixed two-way (handsfree) page and bell or buzzer operation
- 36 station one-way page (using one-way amplified speakers)
- All call (requires V-1134 and reduces number of zones to 34)



- Can be used with a variety of Valcom 45 ohm talkback speakers and paging horns

#### Numbering Plan

- The dialing codes are 0, 5 - 39.

#### Additional Equipment Required

- Valcom -24 Vdc power supply (1A2 type power supply for buzzers)
- Twisted pair cross-connect wire
- 22-24 AWG power wire or cable, and
- Volt-ohm-milliammeter

#### Dimensions/Weight

- 7.1"H x 5.9"W x 2.1"D  
(18.03cm H x 14.99cm W x 5.33cm D)
- 3.5 lbs. (1.6 Kg)

#### Power Requirements

<u>Voltage</u>	<u>Working Limits</u>	<u>Current</u>
Talk Battery	-21.5 to -26 Vdc	90 mA
Signal Battery	-21.5 to -26 Vdc	500 mA
Lamp Battery	9 to 11 Vac	45 mA per lamp

## **Electrical Characteristics**

<u>Parameter</u>	<u>Working Limits</u>
Input Imp. T and R	600 ohm (incl. inst.)
Max. Cable Length:	
One Way Page	5000 feet
Talkback Page	800 feet
Dial Pulses	8-12 PPS 60-40 Break ratio " 10%

### Tone Signals

Standard DTMF

### Frequency

Detect	40MS
Interdigital Time	40MS

### Environmental

Temperature	0° to 50° C
Humidity	0 to 85% Non-precipitating

## **INSTALLATION**

### **Precautions**

All precautions have been taken at the factory to insure that the equipment functions properly when installed correctly. Please observe the following precautions before applying power to the equipment or the equipment may be damaged and the warranty voided.

- Unplug the key system power supply before connecting any wires or cables from the intercom connecting block. With power ON, accidental bridging of two terminals with a wiring tool may damage electronic circuits.
- Do not locate the control unit more than five feet from the power supply.
- Do not use a lamp tester to check signals in the control unit. Use a voltmeter. A lamp tester when first applied, is a short circuit to electronic circuits.
- Do not apply power to the control unit until all connections have been double-checked.

**Limit runs to talkback speakers to not more than 800 feet. Do not split pairs.**

**Make all grounds common at power supply.**

Limit audio runs to one-way speakers to not more than 5000 feet. Limit power runs to one-way speakers to maximum recommended for the particular speaker type.

For off-hook speaker cancel circuit, each ICM "A" lead must be connected through a 10K 1/4W 5% resistor to the inhibit input (W/GR) (Refer to Figures 2 and 3). When "called" station or any other party goes off-hook, the presence of two resistance grounds cancels or turns off speaker. "Handsfree" mode can only be restored by terminating call and redialing station.

### **Mounting**

Mount the V-136RTHF on a 7" KTU mounting, relay rack or on a wall. (The presence of a large "magnetic" field induced by some power supplies may cause a loud 60 cycle hum on talk paths. To clear or reduce hum, mount control unit at least 12" from power supply).

### **Connections**

Fasten a 25 pair cable to the unit and terminate all leads on a 66 type block per Figure 1, 2 or 3. CAUTION: Do not attempt to wire one group (10-29 or 0, 5-9, 30-39) for both bell/buzzer and voice page.

#### Bell/Buzzer Connections

- When using 10-29 for bell/buzzer signaling, connect audible battery (BR/V) to S1 IN (V/O).
- When using 0, 5-9, and 30-39 for bell/buzzer signaling, connect audible battery to S2 IN (O/V).
- Connect bell/buzzer return leads to audible ground from power supply.

#### Voice Page Connections

- When using 10-29 for voice page, connect speaker out (V/G) to S1 IN (V/O).
- When using 0, 5-9 and 30-39 for voice page, connect speaker out (V/G) to S 2 IN (O/V).
- Connect speaker return leads to speaker common (G/V).

### **Programming**

Refer to Figure 1 for programming options.

## **OPERATION**

To make a voice page, go off-hook and dial the number of the desired zone or station. Dial tone will be broken after the first number is dialed. A one second ringback tone will indicate the called zone is being signaled. After the tone, proceed with the page. The called party may answer handsfree. If the speaker cancel circuit is wired (refer to Installation), when called party goes off hook, the speaker will be turned off.

To rering the same station, press the "\*" button. The station will be signaled as long as the \* button is held. To rering using rotary dial, dial "1". The station will be signaled for one second each time a "1" is dialed.

To achieve maximum performance from this system, the user should receive the following operating instructions:

- a. The calling party should speak directly into telephone mouthpiece and avoid speaking too softly.
- b. The called party must wait (approximately 1/2 second) before responding to the calling party.

## **CIRCUIT DESCRIPTION**

### **General Method of Operation**

This unit provides dial intercom access provisions to appropriately interface with the telephone system being used. A two-way amplifier conditions the speech from the telephone system tip and ring, and provides a low impedance, low level output to the desired speaker via conventional telephone wiring, i.e., house cable or station wire.

### **Detailed Description**

When station user lifts handset to make an ICM page, the switchhook contacts in the telephone close the tip and ring to form a loop which returns battery back to turn on transistor Q1. Transistor Q1 operates relay and logic circuit to return dial tone and lamp battery to telephone set. Logic circuit receives dialing information and operates relays and/or circuitry to supply splash tone and a two-way voice connection for station selected. When called or any other party goes off-hook on ICM path, the presence of two resistance grounds cancels or turns off speakers if inhibit resistors are wired. "Handsfree mode" can only be restored by terminating call and redialing station.

## **TECHNICAL ASSISTANCE**

When trouble is reported, verify that:

- All telephone sets are in proper working order
- Power is being supplied to the unit

- There are no broken connections at the connecting block
- The conductors of color-coded cables are terminated in the proper order

If trouble still exists, additional checks should be made using the following equipment:

- Voltmeter
- Tone-dial single-line instrument (for tone-dial systems)
- Telephone Test Set
- Clip leads

Test lamps must not be used to check voltages. They can damage electronic circuits. A telephone test set should not be used to check voltages; the results will be misleading.

Before proceeding further, check the voltages at the connecting block. An undetected blown fuse or low voltage will cause improper control operation. DC voltage measurements are made with respect to (+) ground.

If a spare unit is available, continue to troubleshoot by substituting the spare unit for the suspected unit. If the trouble has not been located, refer to Table 1. Identify the symptoms and perform the corrective actions indicated. After all the suggested tests have been performed, the trouble still exists, telephone Valcom, Inc. at (540) 427-3900 and ask for Technical Support, or call (540) 427-6000 for Valcom 24-hour Automated Support or visit our website at <http://www.valcom.com>.

Valcom equipment is not field repairable. Valcom, Inc. maintains service facilities in Roanoke, VA. Should repairs be necessary, attach a tag to the unit clearly stating company name, address, phone number, contact person, and the nature of the problem. Send the unit to:

**Valcom, Inc.**  
**Repair and Return Dept.**  
**5614 Hollins Road**  
**Roanoke, VA 24019-5056**

### VALCOM LIMITED WARRANTY

Valcom, Inc. warrants its products to be free from defects in materials and workmanship under conditions of normal use and service for a period of one year from the date of shipment. The obligation under this warranty shall be limited to the replacement, repair or refund of any such defective device within the warranty period, provided that:

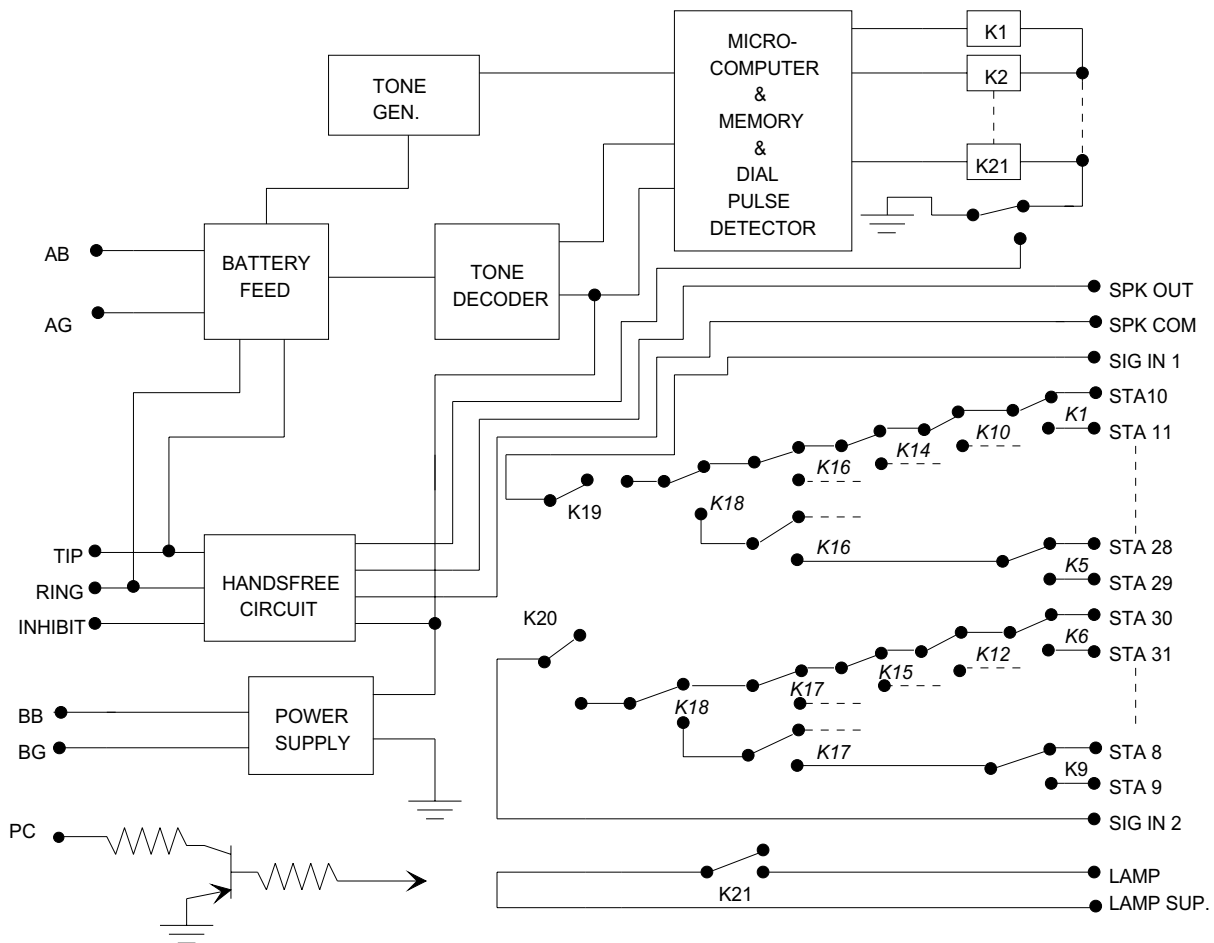
1. inspection by Valcom, Inc. indicates the validity of the claim,
2. the defect is not the result of damage, misuse, or negligence after the original shipment,
3. the product has not been altered in any way or repaired by others and that factory sealed units are unopened (A service charge plus parts and labor will be applied to units defaced or physically damaged),
4. freight charges for the return of products to Valcom are prepaid,
5. all units 'out of warranty' are subject to a service charge. The service charge will cover minor repairs (major repairs will be subject to additional charges for parts and labor).

**This warranty is in lieu of and excludes all other warranties, expressed or implied, and in no event shall Valcom, Inc. be liable for any anticipated profits, consequential damages, loss of time or other losses incurred by the buyer in connection with the purchase, operation or use of the product.**

This warranty specifically excludes damage incurred in shipment in the event a product is received in damaged condition, the carrier should be notified immediately. Claims for such damage should be filed with the carrier involved in accordance with the F.O.B. point.

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**V-136RTHF SIMPLIFIED SCHEMATIC**

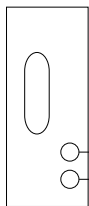
**TABLE 1  
TROUBLESHOOTING CHART**

<b>PROBLEM</b>	<b>CORRECTIVE ACTION</b>
No side tone	Check "A" Battery connections, polarity, and voltage.
No dial tone	Check option switch 1. Check "B" battery connections, polarity and voltage.
No lamps	Check lamp supply voltage and input. Verify that grounds are common at power supply.
No audible signal at station dialed	Check signal voltage at supply and frame locations. Verify that bells and buzzers are common at power supply.
Double signaling	Check option switch 2.
Continuous signaling - stations 10-29 stations 30-39, 0, 5-9	Check option switch 3. Check option switch 4.
Alert tone but no voice page at station	Check option switches 3 and 4.
No volume to speaker	Check phone to speaker volume control. Check * for audio present at tip, ring input BL/W, W/BL pair. Check * for audio at signaled speaker pair at 66B block. Check * for audio at input of speaker.
No volume to phone	Check speaker to phone volume control. Check wiring to talkback speaker. Remove all connections to inhibit pin and verify problem.
Hum heard at phone	Check wiring to speaker. Possible magnetic interference from power supply - relocate unit 12" - 18" away. Check for noisy "A" battery.
No speaker cancel	Verify ground present at phone side of at least (2) 10K ohm resistors.
R.F. Interference	NOTE: The following solutions are listed in order of priority. Not all steps may be necessary to eliminate or reduce R.F. Interference.  Use 12 AWG wire from equipment ground to water pipe ground. Install a .05 MFD Ceramic disc CAPACITOR on the following terminals. a. Talk battery to talk ground b. Signal battery to signal ground c. Tip to ring d. Across each speaker pair e. From inhibit lead (if used) to ground

NOTE: Do not apply ground directly to inhibit input.  
\* Use telephone test set

NOTES:

- 1) INHIBIT OPTION - TO CANCEL SPEAKERS, A 10K 1/4W 5% RESISTOR MUST BE IN SERIES WITH EACH ICM BUTTON "A" LEAD.
- 2) POWER SUPPLY -A BAT. VDC FILTERED TALK BATTERY. B BAT. -24VDC LAMP GND., A GND. AND B GND. MUST BE COMMON AT POWER SUPPLY.
- 3) FOR BEST RESULTS USE 45 OHM SPEAKERS.
- 4) FOR BEST RESULTS SET SPEAKER-TO-PHONE VOLUME AT LOWEST ACCEPTABLE LEVEL.



VOLUME CONTROLS (REAR VIEW)

SPK-TO-PHONE  
PHONE-TO-SPK

5) OPTION PROGRAMMING:

OPTIONS		
SW	ON	OFF
1	NO DIAL TONE	DIAL TONE
2	DOUBLE BURST	SINGLE BURST
3	HF: STA 10-STA 29	BUZZER: STA 10-STA 29
4	HF: STA 30-STA 39, STA 0-STA 9	BUZZER: STA 30-STA 39, STA 0-STA 9

OFF →	
← ON	
1	<input type="checkbox"/>
2	<input type="checkbox"/>
3	<input type="checkbox"/>
4	<input type="checkbox"/>

	A	B	C	D	E	F	
ICM KEYS	T	—	—	W/BL	—	—	
	R	—	—	BL/W	—	—	
POWER SUPPLY	LB	—	—	W/O	—	—	
ICM KEYS	L	—	—	O/W	—	—	
ICM KEYS (NOTE 1)	INH	—	—	W/GR	—	—	
PAGE CONTROL	PC	—	—	GR/W	—	—	
	S10	—	—	W/BR	—	—	R10
	S11	—	—	BR/W	—	—	R11
	S12	—	—	W/S	—	—	R12
	S13	—	—	S/W	—	—	R13
	S14	—	—	R/BL	—	—	R14
	S15	—	—	BL/R	—	—	R15
	S16	—	—	R/O	—	—	R16
	S17	—	—	O/R	—	—	R17
	S18	—	—	R/G	—	—	R18
	S19	—	—	G/R	—	—	R19
	S20	—	—	R/BR	—	—	R20
	S21	—	—	BR/R	—	—	R21
	S22	—	—	R/S	—	—	R22
	S23	—	—	S/R	—	—	R23
	S24	—	—	BK/BL	—	—	R24
BUZZERS OR SPEAKERS	S25	—	—	BL/BK	—	—	R25
	S26	—	—	BK/O	—	—	R26
	S27	—	—	O/BK	—	—	R27
	S28	—	—	BK/G	—	—	R28
	S29	—	—	G/BK	—	—	R29
	S30	—	—	BK/BR	—	—	R30
	S31	—	—	BR/BK	—	—	R31
	S32	—	—	BK/S	—	—	R32
	S33	—	—	S/BK	—	—	R33
	S34	—	—	Y/BL	—	—	R34
	S35	—	—	BL/Y	—	—	R35
	S36	—	—	Y/O	—	—	R36
	S37	—	—	O/Y	—	—	R37
	S38	—	—	Y/G	—	—	R38
	S39	—	—	G/Y	—	—	R39
	S0	—	—	Y/BR	—	—	R0
	S5	—	—	BR/Y	—	—	R5
	S6	—	—	Y/S	—	—	R6
	S7	—	—	S/Y	—	—	R7
	S8	—	—	V/BL	—	—	R8
	S9	—	—	BL/V	—	—	R9
AUDIBLE SIGNAL	S1 IN	—	—	V/O	—	—	
	S2 IN	—	—	O/V	—	—	
HF OUT	SPK O	—	—	V/G	—	—	
	SPK C	—	—	G/V	—	—	
POWER SUPPLY	AG	—	—	V/BR	—	—	
	AB	—	—	BR/V	—	—	
	BG	—	—	V/S	—	—	
	BB	—	—	S/V	—	—	

BUZZER OR SPEAKER RETURN

CABLE FROM CONTROL UNIT      66B350 SPLIT BLOCK

FIGURE 1: CONNECTING BLOCK ARRANGEMENT V-136RTHF



