Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules .These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiated radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution:

To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. (example-use only shielded interface cables when connecting to computer or peripheral devices).

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Arbitrator
Microphone System

OPERATING MANUAL

General

Thank you for purchasing this state-of-art, Arbitrator series microphone system, which consists of a transmitter and receiver. The operating frequency of this series is in UHF band. To have a trouble free operation, please read this owner's manual thoroughly.

The Arbitrator series consists of the following items :

	Item	Qty	Function
1	Transmitter (Model #CY-2005 T)	1	Transmit audio and trigger signal to receiver.
2	Receiver (Model # CY-2005 R)	1	To receive signal from transmitter.
3	Lavalier microphone for transmitter	1	Act as audio input for the transmitter.
4	Receiver power supply cable	1	To connect DC IN of receiver to car battery.
5	Audio output cable	1	To connect receiver audio out to voice recorder.
6	Lavalier microphone for voice recorder.	1	For car inside use only. Direct audio input to the voice recorder.
7	Trigger cable	1	To connect receiver trigger output to voice recorder.
8	Charging cable for transmitter	1	To charge transmitter from car cigarette lighter DC outlet.
9	Antenna extension cable	2	For connection between antenna base station to receiver.
10	Antenna base station	2	For securing antenna on car rooftop.
11	Receiving Antenna	2	To receive RF signal from the transmitter.
12	External antenna	2	To receive RF signal from the transmitter.
13	Rechargeable battery pack	1	Battery for transmitter.
14	Mounting ear piece	2	For securing receiver in the car.

Transmitter

RF generation and control	PLL synthesizer
Frequency range	600 ~ 700 MHZ
Switching bandwidth	25MHZ
No. of channels	100 (at 250 KHz step)
Frequency Stability	+/- 0.005%
RF output power	50mW
Modulation	FM
Peak Modulation	+/- 40 KHz
Audio system	Compander system (SA572)
AF frequency response	100Hz ~15 Khz +/- 3 dB
Current consumption at normal voltage	Battery AA * 2 (Alkaline) or Ni-MH rechargeable battery.
Power supply	130 +/- 10 mA
Display method	LCD 8*2 (Blue) Back-light
Antenna	1/4 wave, whip antenna (soft type)
MIC IN Connector	4 pins min-XLR type
Microphone Capsule	Lavalier MC-16 or Headset
Charge function	Yes
Key lock function	Yes
Battery low and power LED	Red
Control key	UP, DOWN, SET
Trigger switch	Push "Set" button.
Display Function	**1**. Model **2**. Channel **3**. Frequency **4**. User name **5**. Battery **6**. Battery level **7**. Sens level **8**. Battery low **9**. Functionlocked **10**. Data received.

Specifications

RF generation and control	PLL synthesizer
Frequency range	UHF 600 ~ 700 MHZ
Switching bandwidth	25 MHz
Quality of channels	100 (at 250 KHz step)
Frequency Stability	+/- 0.005%
Receiving mode	True diversity
Sensitivity	> -95dBm at S/N ration >75dB
T.H.D	< 0.7 %
S/N Ratio	> 90dB
Modulation	FM
Peak Modulation	+/- 40khz
Audio system	Compander system (SA572)
AF frequency response	100Hz ~15 Khz +/- 3dB
AF output	1.2V RCA (BLACK)
Squelch	Noise squelch & Pilotone
Pilotone system	32.768 KHz
Power supply	230 +/- 10 mA (excluding charging)
Power switch	DC 9~15V (For CAR)
Current consumption at normal voltage	ON-OFF Switch
Display	LCD 16*2 Back-light
Antenna socket	BNC type
Charge function	Yes (for TX)
Digital signal for record	YES
LED display	RF*4 AF*4 Charge LED *1 red
Auto SCAN	YES
Control Keys	UP, DOWN, SET

Part names of receiver

Receiver front panel

Fig.1

1.RF signal indicator
2.AF signal indicator
3.LCD
4.Charging indicator
5.△ (UP) button
6.SET
7.▽ (DOWN) button

Receiver rear panel

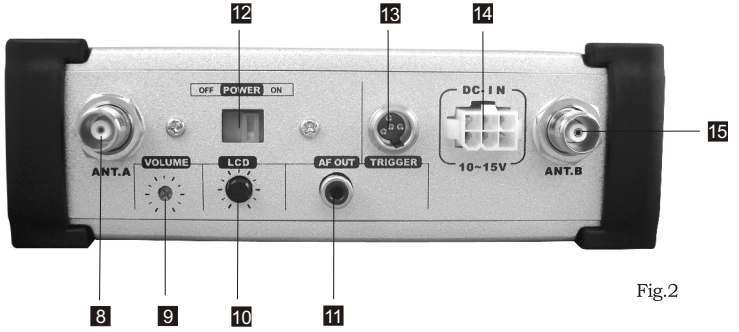
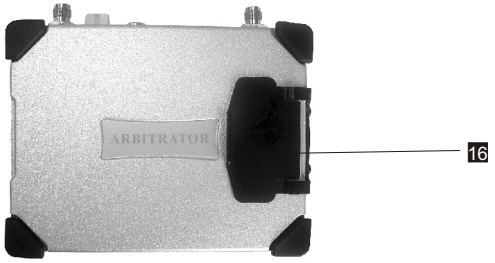


Fig.2

8.Antenna A
9.Volume control
10.LCD brightness adjust
11.AF output
12.Power switch
13.Trigger output
14.DC IN
15.Antenna B

Receiver top panel



16.Charging cradle data port

Fig.3

Part names of transmitter

Transmitter Front View

Fig.5

Fig.4

Transmitter Back View

Fig.6

1.Antenna
2.Condenser microphone (built in)
3△ (UP) button
4.SET / MUTE
5▽ (DOWN) button
6.POWER
7.Battery compartment cover
8.Belt-clip

Transmitter Top View

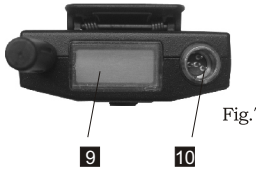


Fig.7

Transmitter Side View ①

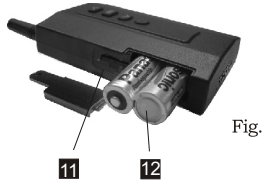


Fig.8

Transmitter Side View ②

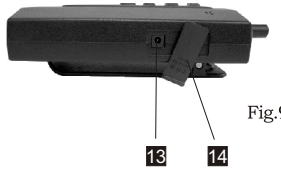


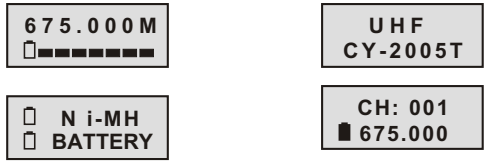
Fig.9

Transmitter Botton View

Fig.10

9.LCD
10.MIC In connector
11.Battery compartment slide release
12.Battery compartment
13.DC IN charging port
14.Rubber cover
15.Drop in charging cradle data port

2.The SET button is being pressed for a few seconds to activate changes.
In this case, △ or ▽ buttons act as rolling up or down the alphanumeric characters, not the pages.



Remark	Changes can NOT be make at the following pages.

To lock and unlock the transmitter

Use △ or ▽ button to go to the following page :

Press SET for a few seconds, cursor will flash at the ON / OFF wording. Use △ or ▽ to change the status. Press SET again for a few seconds will store the change into the memory.

When System Lock is ON, the power switch and channel change functions will be defeated. To unlock, repeat the above procedure and change it to System Lock OFF status to return to normal function.

Making changes to transmitter Channel setting

Use △ or ▽ button to go to the following page :

Press SET for a few seconds, cursor will flash at the CH No.. Use △ or ▽ to change the channel no. from 001 to 100. After the desired channel has been selected, press SET again for a few seconds will store the change into the memory. Please be reminded that for the system to work the channel selected at the transmitter must be the same as that of the receiver.

Function of MUTE

When system is in " Lock " mode, SET switch will become a MUTE SWITCH.
Press MUTE SWITCH 2 times quickly, system will enter into MUTE-ON status.
Press MUTE SWITCH another time, system will become MUTE-OFF.

2.The 2nd method to start the Auto Scan function is to place transmitter into the drop in charging cradle data port (11) on top of the receiver, the charging indicator on the receiver front panel will start flashing and receiver auto scan function will start automatically. The channel digit will roll through all the 100 channels until a clean channel has been selected. When auto scan is completed, the following page will appear :

FINISH SCANNING
DUMP DATA TO TX

Which indicate the selected data (including user name) has been successfully transferred to the transmitter. At this moment RF level indicator in receiver front panel will light up indicates receiver has received the RF signal from the transmitter.

When voice is spoken into either the built-in condenser or lavalier microphone, AF indicator in receiver front panel will flash.

Transmitter

Functions of the transmitter control buttons.

The function of the transmitter is to transmit the audio modulated signal to the receiver via radio link. In this case through the UHF band. Voice could be picked up either through the built-in condenser microphone of the lavalier microphone worn by the user.

Function of SET button.

The SET button has two functions:
1.It serves as activate and store keys.
2.Shift key when a change is activated.

Functions of △ and ▽ (UP and DOWN) buttons.

The △ or ▽ buttons behave differently at the two following conditions.

1.When SET button is not pressed to activate changes.
The △ or ▽ buttons only serve to roll fort and back the following pages :

675.000M
▯▬▬▬▬▬▬

UHF
CY-2005T

SYSTEM
LOCK ON

USER NAM
CH: 001

▯ N i-MH
▯ BATTERY

CH: 001
▮ 675.000

Accessories

Lavalier microphone for transmitter

Fig.11

Receiver power supply cable

Fig.12

Audio output cable

Fig.13

Lavalier microphone for voice recorder

Fig.14

Antenna extension cable

Fig.15

Trigger cable

Fig.16

Charging cable for transmitter

Fig.17

Antenna with base station

Fig.18

Antenna base station

Fig.19

Antenna

Fig.20

Rechargeable battery pack

Fig.21

External antenna

Fig.22

Bracket for securing receiver

Fig.23

Installation diagram :Receiver

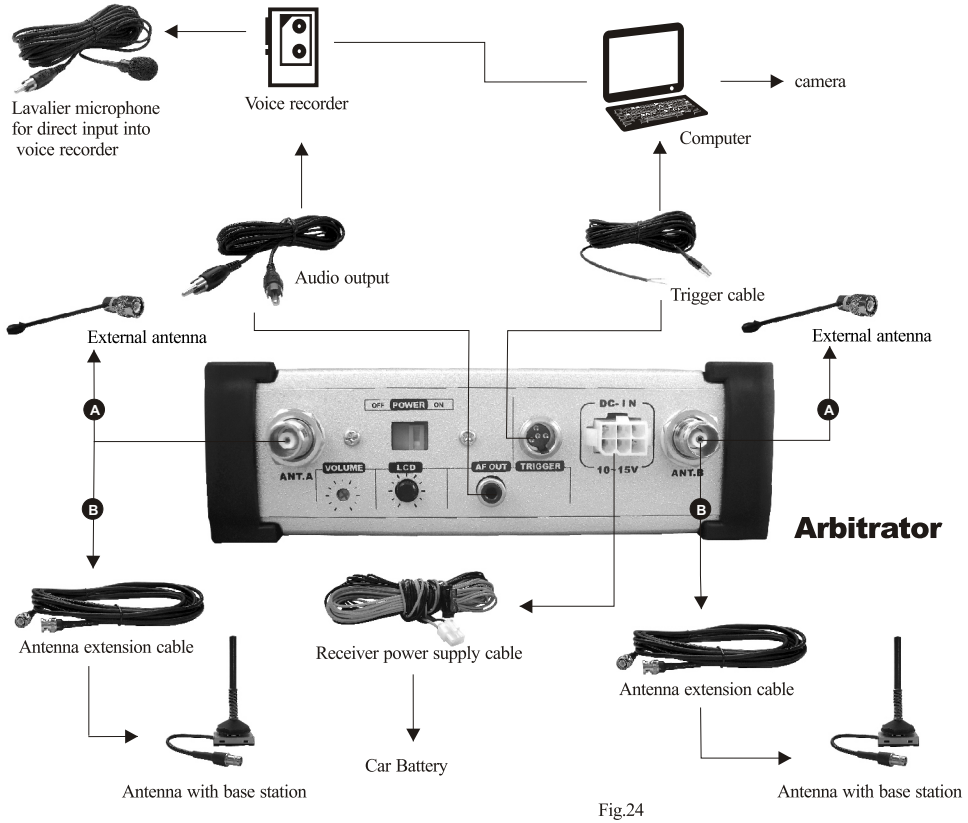


Fig.24

Installation diagram :transmitter

Fig.25

USER NAME setting.

Use △ or ▽ to go to the CHANNEL / USER NAME page as follow :

CHANNEL: 025
USER NAME

USER NAME can only be modified in this page, not in the ARBITRATOR / USER NAME page.

At first time power on, there is no specific User Name stored. If user thinks that it is necessary to give it a User Name to the ARBITRATOR series, please follow the instruction below to add it in.

It is NOT possible to change the 1st line which shows CHANNEL No., To make changes to the USER NAME setting, press MENU button for a few seconds until cursor flashes at 1st alphabet in the 2nd display line, use △ or ▽ button to roll through the alphanumeric characters. When the desired level has been selected, press MENU once to move the cursor one step forward, use △ or ▽ button to roll through the alphanumeric characters. Repeat this sequence until all desired characters have been selected. Press MENU for a few seconds again to store the selection into the memory. The stop flashing of the cursor indicates successful storage. Both ARBITRATOR / USER NAME and CHANNEL / USER NAME pages will show the newly programmed USER NAME.

ARBITRATOR
USER NAME IN

When MENU button is not pressed for a few seconds after selection, no storage will be done and the previous stored data will stay in memory.

How does Auto Scanning work ?

The receiver Auto Scan can work in two different ways, with or without the transmitter.

1.Use △ or ▽ to go to the AUTO SCANNING page as follow :

AUTO SCANNING
CHANNEL : 025

To start the Auto Scan function, press MENU button for a few seconds until Auto Scanning start. The channel digit will roll through all the 100 channels until a clean channel has been selected. When auto scan is completed, the following page will appear :

FINISH SCANNING
DUMP DATA TO TX

2.When MENU button is pressed for a few seconds to activate changes at a particular page.

In this case, △ or ▽ buttons act as rolling up or down the alphanumeric characters, not the pages.

Making changes to receiver display pages.

Receiver CHANNEL / FREQUENCY setting

Use △ or ▽ to go to the CHANNEL / FREQ page as follow :

```
CHANNEL:    025
FREQ:681.000MHZ
```

Changes to CHANNEL / FREQUENCY setting is only permitted in this page.

The Arbitrator has 100 factory preset channels available for selection. At first time power on, the CHANNEL No. shown is the factory preset channel. If this channel is not suitable at user's site, please change it to the desired one.

To make changes to the channel setting, press MENU button for a few seconds until cursor flashes at the channel digit. To select a particular channel, use △ or ▽ button to roll through channel 001 to 100. When the desired channel has been selected, press MENU for a few seconds again to store the change into the memory. The stop flashing of the cursor indicates successful storage. Both the CHANNEL / FREQ and ARBITRATOR / CHANNEL pages will show the newly programmed channel number.

```
ARBITRATOR
CHANNEL :  025
```

However, when MENU button is not pressed again for a few seconds after selection, no storage will be done and the previous stored data will stay in memory.

Receiver Squelch setting

Use △ or ▽ to go to the SQUELCH SETUP page as follow :

```
SQUELCH SETUP
LEVEL : 01
```

The Arbitrator has 10 factory preset Squelch levels available for selection. At first time power on, the squelch level shown is the factory preset level. If this level is not suitable at user's site, please change it to the desired one.

To make changes to the squelch level setting, press MENU button for a few seconds until cursor flashes at the level digit. To select a particular level, use △ or ▽ button to roll through level 01 to 10. When the desired level has been selected, press MENU for a few seconds again to store the selection into the memory. The stop flashing of the cursor indicates successful storage. When MENU button is not pressed after selection, no storage will be done and the previous stored data will stay in memory.

The Arbitrator series of radio microphone is intended to be installed in the car of security personnel.

The receiver should be installed inside the car near the driver or in the trunk of the car. Mounting brackets (23) are provided for fixing the receiver securely to the car. The power supply for the receiver comes from the car battery via the power supply cable (12). Two remote antennas (20) are to be placed at the car rooftop and connected to the receiver via the antenna extension cables (15). Antenna base stations (18) are available for fixing the antenna to the car.

When remote antennas are not needed, two other antennas (22) are available to be fixed directly on the receiver.

The trigger output (13) from the receiver is connected to the laptop computer via the trigger cable (16). Once a trigger signal is received from the transmitter, the computer will switch on the video camera as well as the voice recorder.

Audio output (11) of the receiver is connected to the voice recorder via an audio cable (13) for recording purposes.

There is another lavalier microphone (14) available to be connected directly to the voice recorder and this is to be installed inside the car.

As for the transmitter,install the lavalier microphone for transmitter (11) into the transmitter MIC IN socket (10). Belt clip is available on the back of the transmitter for wearing it on the belt.

The power supply of the transmitter comes from two AA type batteries. Please use the Panasonis rechargeable battery pack (21) supplied. When inserting the battery, please take extra care to insert it according to the correct polarity of the battery.

When the receiver is installed in the trunk of the car and charging of the transmitter battery is not possible via the receiver charging port, please use the supplied charging cable for transmitter (17) and charge the batteries from the cigarette lighter outlet of the car.

Operating instruction

The Arbitrator series is a radio product. It consists of a transmitter and a compatible receiver. To operate the system, one must first switch on the receiver and the corresponding transmitter. The power switch (12) of the receiver is situated at the rear panel of the receiver. After switching on, slot in the transmitter into the receiver charging cradle data port (16). Auto scan function will start automatically and the selected clean channeled will then be transferred to the transmitter.

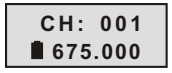
However, when the receiver is placed at the trunk of the car, auto scan will not work this way and no data transfer will happen. In such event, the user must manually set the transmitter channel to match with the receiver channel.

When transmitter and receiver have the same channel switched on, the RF indicator will light up. When voice is spoken into the microphone of the transmitter, AF indicator LED will also light up.

LCD pages of transmitter and receiver

Receiver display pages

Transmitter display pages



Receiver function

The function of the Arbitrator receiver CY-2005R is to capture the RF signal radiated from the Arbitrator transmitter CY-2005T. The Arbitrator CY-2005R is a true diversity receiver. Thus two antennas are needed. The demodulated audio signal from the receiver is then fed into the voice recorder. The voice recorder will only start to work when it receives the trigger signal from the Arbitrator transmitter CY-2005T.

What is Squelch ?

Squelch is to mute or silence the audio output of the receiver in the absence of the desired radio signal. When the desired signal is lost, due to dropout, excessive distance or loss of transmitter power, the receiver may pick up background radio noise.

The squelch circuit here is an audio switch controlled by the radio signal level using a manually adjustable level. When the received signal strength falls below this level the output of the receiver is then muted. Ideally, the SQ level should be set just above the background noise level or at the point where the desired signal is becoming too noisy. Higher SQ level setting requires higher received signal strength. Since received signal strength decreases as transmission distance increases, higher SQ level setting will decrease the operating range of the system.

Function of MENU button.

The MENU button has two functions:

1.It serves as activate and store keys.
2.Shift key when a change is activated.

Functions of △ and ▽ (UP and DOWN) buttons.

The △ or ▽ buttons behave differently at the two following conditions.

1.When MENU button is not pressed to activate changes.
The △ or ▽ buttons only serve to roll fort and back the following pages :