AOR ®

AR-110

Still picture facsimile unit

Operating manual

AOR, LTD.

Index

1: Introduction

Thank you for purchasing the AR-110 Still picture facsimile unit. The AR-110 is designed using the very latest technology to ensure the highest levels of performance and reliability. To get the best possible results from your AR-110. We recommend that you read this manual and familiarize yourself with the receiver.

Apparent faults may be due to accidental misoperation of the unit. If you think there is a problem, carefully read all the manual before deciding to contact us.

It is acknowledged that sections of this manual are repetitive, this is to enable the manual to be used as a reference book. Due to international nature of the product, some graphics contain Japanese characters.

Every effort has been made to make this manual correct and up to date. Due to continuous development of the product and by error or anomalies may be found and this is acknowledged.

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2: Features

- Send and receive still video pictures from a video camera, CCD camera, digital camera, VCR equipment with NTSC format.
- Capable of sending/receiving video pictures via a Cellular phone with an external digital modem.
- Capable of sending/receiving video pictures via an analog telephone line with an external telephone modem.
- Remote control by means of DTMF codes
- Specify the other party using an ID number
- Selectable communications modes: Fast speed mode, Normal mode, Fine mode (High resolution mode)
- Capable of sending/receiving video pictures via an analog telephone line without modem. (Optional AR-T110 telephone interface unit required.)

3: Accessories supplied

The following items are provided in the carton box:

1 --   AR-110 unit

1 --   Radio cable

1 --   Digital/communication cable

1 --   DC power cable

1 --   Operation manual (this booklet)

1 --   Mobile mounting bracket

4: Controls and functions

4.1: Front panel
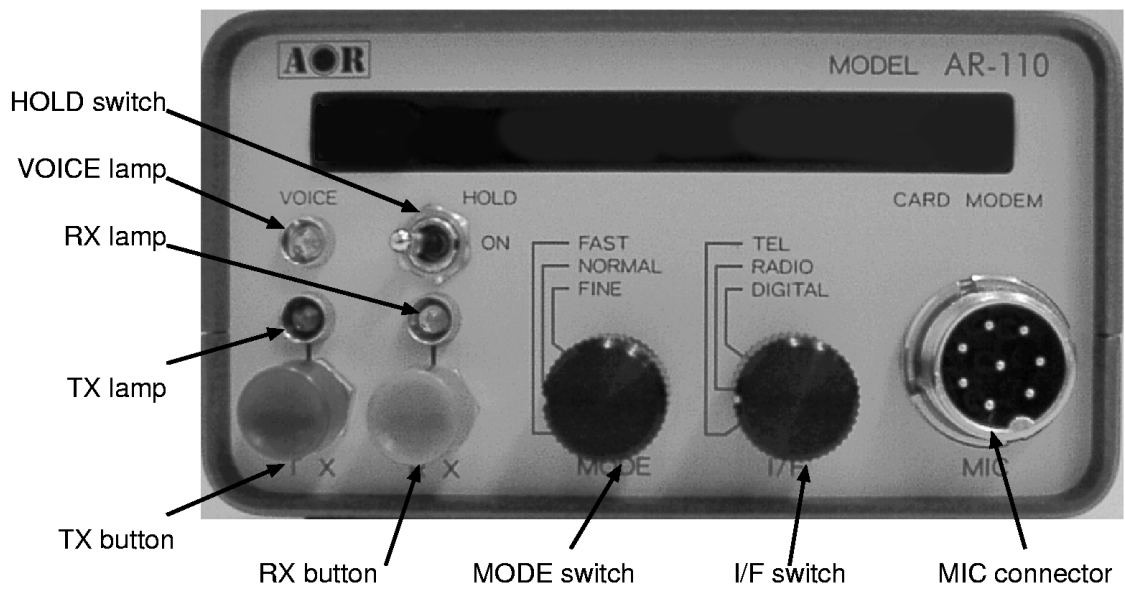
TX switch button --- Push to transmit

RX switch button --- Push to force receiving or transmit send request

TX LED lamp ----- Lit while transmit

RX LED lamp ----- Lit while in the receive standby mode

VOICE LED lamp -- Voice communication is available when lit

MIC connector -- Connect a radio microphone

PC card slot ------ Insert a PC card

HOLD switch --- Switch to HOLD side to disable receiving

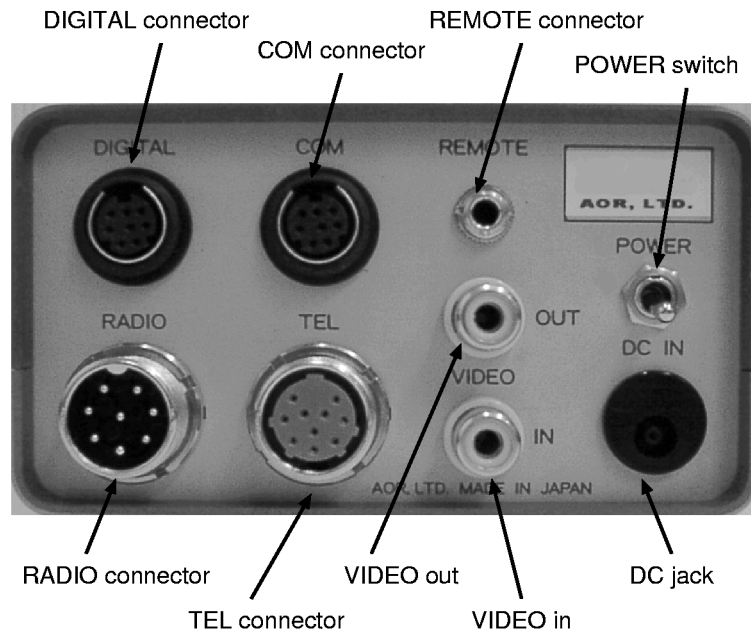I/F switch -------- Select an interface mode

MODE switch -- Select a picture quality

4.2: Rear Panel

DIGITAL connector -- Using a supplied digital/com cable, connect an external modem

COM connector --------- Using a supplied digital/com cable, connect to a PC

RADIO connector ---- Using a supplied radio cable, connect to a radio or an optional
analog telephone line interface

TEL connector --------- Connect an optional AR-T110 analog telephone line interface

REMOTE connector -- Connect an optional wired remote control unit

VIDEO IN connector -- Connect a video equipment

VIDEO OUT connector -- Connect a video monitor (NTSC composite)

DC jack   ----------- Using a supplied DC power cable, connect a DC power
supply

Power switch ---------------- Power on/off switch

5: Connections with peripherals

Video camera

As a video signal input device, the following units can be used:

Video camera, CCD camera, digital camera, etc. (NTSC format)

Video monitor

Use a NTSC format composite video monitor

Power supply

Connect a regulated DC power supply (11.7 ~ 15.7 V DC, 1.5 A minimum)

Radio

Using a supplied radio cable, connect to your radio microphone connector.

(Refer to radio interface for details.)

Microphone

Connect a radio microphone

(Refer to radio interface for detail.)

PC

Using a supplied digital/com cable, connect to your any open active serial port.

If your PC serial port has a different type of the connector other than a D-Sub 9 pin,

please use a proper adapter.

Analog telephone line

The AR-110 is capable of sending/receiving video pictures via analog telephone line.

(Optional AR-T110 analog telephone interface is required.)

6: Operations

[**Caution: If the telephone interface is NOT connected to the AR-110, please do not set the I/F switch to the TEL position. This will result malfunctioning of the AR-110. If you did so by accident, turn the power off and then back it on.**]

6.1: Radio operation

6.1.1: Transmit

1. Make sure the transmitter ID and the receiver ID are the same.
2. Set the **I/F** switch to the **RADIO** position.
3. Select the **MODE** switch to the desired position.
4. Set the **HOLD** switch to the **OFF** position.
5. Turn the power switch of the AR-110 and the peripherals on.
6. Aim the camera and push the **TX** switch. If a monitor display is connected to the AR-110, you can view it on the screen. Push the **TX** switch again to take in the picture and then transmit it from the radio.
7. To stop sending the picture during transmission, press and hold the **RX** switch.
8. When the transmission is completed, the AR-110 will automatically go into the receive standby mode.

Voice communications

Voice communication is available only when the **VOICE LED** lit. While the video picture is transmitted, voice operation will be disabled by the AR-110.

6.1.2: Receive

1. Make sure the transmitter ID and the receiver ID are the same.
2. Set the **I/F** switch to the **RADIO** position.
3. Set the **HOLD** switch to the **OFF** position.
4. Turn the power switch of the AR-110 and the peripherals on.
5. When the signal is received by the AR-110, it will automatically go into the receive mode. During receive, both the **TX LED** and the **VOICE LED** go off, and the **RX LED** blinks. A picture quality is automatically detected by the AR-110, and therefore, there is no need to preset the picture quality. In the event of poor air propagation (and thus there are noise on the signal), the AR-110 may not go into automatic receive mode. If it happens, push the **RX** switch to force the AR-110 into receive mode. However, if the receive side of

the AR-110 is not set to the same picture quality mode with the transmit side of the AR-110, then the receive picture may not be visible.

6. To stop receiving the picture, press and hold the **RX** switch until the **RX LED** lit solid.

6.2: Modem operation (External digital modem required.)

6.2.1: Transmit

1. If not done so, set the destination phone number using the **PHO** command.
2. Set the **I/F** switch to the **DIGITAL** position.
3. Select the **MODE** switch to the desired position.
4. Set the **HOLD** switch to the **OFF** position.
5. Turn the power switch of the AR-110 and the peripherals on.
6. Aim the camera and push the **TX** switch. The AR-110 will automatically take in the picture and then dial the number, and then transmit it through the modem. Unlike other modes, it is not possible to stop sending during transmission.
7. When the transmission is completed, the AR-110 will automatically go into the receive standby mode.

6.2.2: Receive

1. Set the **Auto Receive** function active.
2. Set the **I/F** switch to the **DIGITAL** position.
3. Set the **HOLD** switch to the **OFF** position.
4. Turn the power switch of the AR-110 and the peripherals on.
5. When a call is received, the AR-110 will automatically respond it, and go into the receive mode. During receive, both the **TX LED** and the **VOICE LED** go off, and the **RX LED** blinks. Unlike other modes, it is not possible to stop receiving during transmission.

6.3: Telephone operation

The AR-110 can send/receive the video picture through analog telephone line with an optional AR-T110 analog telephone interface unit.

6.3.1: Transmit

1. If not done so, set the destination phone number using the **PHO** command.
2. Set the **I/F** switch to the **TEL** position.
3. Select the **MODE** switch to the desired position.

4. Set the **HOLD** switch to the **OFF** position.
5. Turn the power switch of the AR-110 and the peripherals on.
6. When the **AT command** is set to **ON**, and the phone number is set by the **PHO** command, then the **Auto dialing** function can be activated.

   When the **Auto dialing** function is activated, you will perform the following. .
   1. Aim the camera, and push the **TX** switch of the AR-110. If a monitor display is connected to the AR-110, you can view it on the screen. Push the **TX** switch again.

   Then you will see the following.
   1. The AR-110 will automatically take in the picture, and dial the phone number.
   2. After the line is connected, and receiving the control DTMF signals from the receiver side of the AR-110 as an acknowledgement, the picture will be sent.
   3. After the transmission is completed, the phone line will be disconnected.
   4. In case there is no response from the receiver, the phone line will be automatically disconnected after 30 seconds. No redialing will take place.

   When the **Auto dialing** function is NOT activated, you need to perform the following.

   1. Dial the number from the telephone connected to the AR-110.
   2. When the receiver responds to the call, then aim the camera, and push the **TX** switch.
   3. The AR-110 will take in the picture, and then transmit it.
   4. During transmit, you may on-hook the handset. If you wish to talk to the receiver after transmission, however, you must off-hook the handset. Otherwise, the phone line will be disconnected after transmit.

7. To stop transmit, press and hold the **RX** switch.
8. After the transmission is completed, then the AR-110 will go into the receive standby mode.

6.3.2: Receive

1. Set the **I/F** switch to the **TEL** position.
2. Set the **HOLD** switch to the **OFF** position.
3. Turn the power switch of the AR-110 and the peripherals on.
4. When the **Auto receive** function is activated, you will see the following.

    1. After the telephone rings for preset number of times, the AR-110 will answer to the call, and then start receiving the picture. In the meantime, the acknowledgement signal is sent to the transmit party by the DTMF tones.
    2. After the receiving is completed, the phone line will be automatically disconnected.

    When the **Auto receive** function is NOT activated, you need to perform the following.

    1. When the telephone rings, pick up the handset and answer the call.
    2. If the **Auto dialing** function is NOT activated with the transmit party, then ask them to push the **TX** switch of the AR-110.

        If the **Auto dialing** function is activated, either pushing the **TX** switch of the transmit party or sending the DTMF codes (**11#**) from the receive party with the phone set will enable receiving the picture.

        NOTE: Acknowledgement signal from the receive party
        When the Auto receive function is activated with the receive side, and the AR-110 answers to the call, then the AR-110 responds to the transmit party by sending back the DTMF codes (11#).
        This will allow the transmit side know that the receive side answers to the call.

6.4: Other operations
6.4.1: Remote control by DTMF tones (Radio mode)

In the radio mode, you can remote control the transmit side of the AR-110 by using the DTMF tones.

We will refer the receive party of the AR-110 as the **Base AR-110**, and the transmit party (to be remote controlled) of the AR-110 as the **Remote AR-110** in this section.

1. Setting of the AR-110
   (a) Set the both AR-110 to the **RADIO** mode with the **I/F** switch.
   (b) Set the **DTM** command of the **Base AR-110** to **OFF**.
   (c) Set the **ID** number of the **Base AR-110** to **12**.
   (d) Set the **DTM** command of the **Remote AR-110** to **ON**.
   (e) Set the **ID** number of the **Remote AR-110** <u>other than</u> **12**.
2. When the **Base AR-110** sends the DTMF command, the **Remote AR-110** will respond to it and send the picture back to the **Base AR-110** automatically.
3. After the pictures is received, both AR-110 will go into the receive standby mode.

COMMAND Format (RADIO Mode)   ---- MID3#

M --- Picture Quality ---   1 … FINE mode

2 … FAST mode

3 … NORMAL mode

I ---- ID number (10 digit)

D --- ID number   (1 digit)

3 ---- Fixed

---- Fixed

[Example]   Fast mode, ID number 08   ---- **2083#**

6.4.2: Remote receive (Radio mode)

By simply pushing the **RX** switch of the **BASE AR-110**, you can take in the picture and receive it back automatically.

1. Setting of the AR-110
   (a) Set the **DTM** command and the **ATX** command of the **Base AR-110** to **ON**.

(b) Set the **DTM** command of the **Remote AR-110** to **ON**.

(c) Set the **DTM** command of the **Remote AR-110** to **ON**.

(d) Set the **ID** number of the **Remote AR-110** and the **BASE AR-110** <u>same other than</u> **12**.

2. When the **RX** switch of the **Base AR-110** is pushed, then the **Remote AR-110** will respond to it and send the picture back to the **Base AR-110** automatically.

6/4.3: Polling function (Radio mode)

The **Polling** function is available in the radio mode.

The **Polling** function enables the user to receive the picture only from selected AR-110. To activate the **Polling** function, perform the following.

1. Set the **ID** number to **12** of the receiving AR-110. Set the **ID** number of other AR-110 (to send the picture) to any number other than **12**. No same **ID** number should be used.

2. Set the **DTM** command and **LOO** command of transmitting AR-110 and the receiving AR-110 to **ON**.

3. Push the **RX** switch of the receiving AR-110. This activates the **Polling** function, and each transmitting AR-110 start sending the picture according to the **ID** number.

4. To stop the **Polling** function, push the RX switch of the receiving AR-110.

5. Pushing the **RX** switch of the receiving AR-110 will toggle the **Polling** function activated/deactivated.

6.4.4: Remote control by DTMF tones (Telephone mode)

Like as in the radio mode, you can remote control the transmit side of the AR-110 by using the DTMF tones in the telephone mode.

We will refer the receive party of the AR-110 as the **Base AR-110**, and the transmit party (to be remote controlled) of the AR-110 as the **Remote AR-110** in this section.

1. Setting of the AR-110
   (a) Set the both AR-110 to the **TEL** mode with the **I/F** switch.
   (b) Set the **DTM** command of the **Base AR-110** to **OFF**.
   (c) Set the **DTM** command of the **Remote AR-110** to **ON**.
   (d) Set the **ATS** command of the **Base AR-110** to **OFF**.
   (e) For <u>manual answer</u> by the **Remote AR-110**, set the **ATH** command to **OFF**.

   For <u>auto answer</u> by the **Remote AR-110**, set the **ATH** command to **ON**.
2. Dial the number to the destination using a telephone connected to the **Base AR-110**.
3. When the line is connected, send the DTMF tones by the telephone connected to the **Base AR-110**.

6.4.5: Remote receive (Telephone mode)

By simply pushing the **RX** switch of the **BASE AR-110**, you can take in the picture and receive it back automatically.

1. Set the **I/F** switch of the transmit side of the AR-110 and the receive side of the AR-110 to **TEL**, and the **HOLD** switch to **OFF**.
2. Set the **ATH** command of the transmit side of the AR-110 to **ON**, and then set the number of rings before answering to the call by using the **RCN** command..
3. Set the **ATS** command of the receive side of the AR-110 to **ON**, and set the telephone number to call by using the **PHO** command.

To activate the Remote receive, push the **RX** switch of the receive side of the AR-110. After the picture is sent, and the **LOO** command is set to **OFF**, then the line will be disconnected after 30 seconds. If the **LOO** command is set to **ON**, the picture will be sent repeatedly until the **RX** switch of the receive side of the AR-110 is pushed.

6.4.6: Broadcasting function

In the radio mode, the **Broadcasting** function is available. The Broadcasting function is to send the picture to anyone who is receiving the signal at the same time.

Set the **ID** number of the transmit side of the AR-110 and the receive side of the AR-110 the same <u>other than **12**</u>.

The picture sent from the transmit side can be received by all AR-110s those **ID** number are set to the same.

If the **ID** number of the transmit side of the AR-110 is set to **12**, then all receivers can receive the picture regardless of the **ID** number of the receiver.

6.4.7: Repeater function

The AR-110 has a **Repeater** function. By activating the **Repeater** function, you can extend a service range in the radio mode. Also, it is possible to relay the picture signal from a radio line to a telephone line.
Settings:

    <u>Transmit side</u>:   **I/F** switch --- as desired
                               Picture mode --- as desired
                               HOLD switch -- as desired

    <u>Receive side</u>:   **I/F** switch --- as desired
                               Picture mode -- as desired
                               HOLD switch – **OFF**

Procedures:
1. Set the **I/F** switch of the repeater AR-110 to the same as the transmit side of AR-110 **I/F** switch setting.
2. Set the **HOLD** switch to **OFF**.
3. Send the picture from the transmit side.
4. After the picture is received by the repeater side of the AR-110, set the **I/F** switch to the same as the receiver side of AR-110 **I/F** switch setting.
   Then set the **HOLD** switch to **ON**, and send the picture to the receive side of the AR-110.
5. Make sure the original picture is successfully received by the receive side of the AR-110.

6.5: Picture quality mode

The Picture quality mode is selectable by the **MODE** switch. Three (3) different picture quality mode available in the **Radio mode** and the **Telephone mode**.

- FAST Mode --- Transmission time --- approximately 27 seconds
  (352 x 240 pixels)
- NORMAL Mode --- Transmission time --- approximately 69 seconds
  (352 x 240 pixels)
- FINE Mode --- Transmission time --- approximately 69 ~ 178 seconds
  (736 x 480 pixels)

[NOTE] The transmission time described above does not include a time to take in the picture and/or sending data header that is sent at the beginning of the transmission. Therefore, a total transmission time will take little longer than described above.

In the **FINE** mode, the operation and the transmission time depends on the **FIN** command setting.

In the **DIGITAL** mode, three (3) different picture quality mode are available.

- FAST Mode --- JPEG High compression mode
  (Data size: approximately 26 KB)
- NORMAL Mode --- JPEG Medium compression mode
  (Data size: approximately 64KB)
- FINE Mode --- JPEG Low compression mode
  (Data size: approximately 100KB)

[NOTE] An actual transmission time depends on the modem and a digital line quality.

6.6: HOLD switch

While the **HOLD** switch is set to the **ON**, the R**X LED** will go off. And the AR-110 will <u>NOT</u> take in a new picture or store it into memory. The picture in the memory will be retained until the power switch turns to **OFF**.

6.7: Operation during transmit

The following will take place during transmission after the **TX** switch is pushed.

1. The **RX LED** goes off and exit from the receive standby mode. At this point, the **VOICE LED** is lit, and voice communication is available in the radio mode or telephone mode.
2. When the **HOLD** switch is set to **OFF**, a new picture can be taken from the video input device. If the **HOLD** switch is set to **ON**, a picture cannot be taken.
3. After the picture is captured into memory, then the AR-110 start sending the picture with the designated mode. During sending the picture, the **VOICE LED** goes off, and therefore, no voice communication can be made. In the meantime, the **TX LED** lit indicating the AR-110 is in the transmit mode. If no video input device is connected to the AR-110 or the video input device is not working, the AR-110 will not send the picture, and remain in the receive standby mode. However, if the **HOLD** switch is set to **ON**, then the stored picture in the memory will be sent.
4. During a transmission, a black line appears on the monitor display and scrolls it down.
5. After a transmission is completed, the AR-110 will return to the Receive standby mode.

7: Settings

All settings to the AR-110 can be made through a PC.

7.1: PC system

The following is a requirement for your PC. Any PC can be used regardless its OS (Operating System) if your PC has ;

- One active available open serial port (RS-232C), and
- Baud rate of the serial port is available faster than 9600 bps, and
- A terminal software to support the following:

    Communication speed   -----   9600 BPS

    Data length   -------------------   8 bit

    Stop bit ---------------------------   1 bit

    Parity -----------------------------   None

    Flow control --------------------   Hardware (RTS / CTS)

    TX carriage return -----------   CR

    RX carriage return ----------   CR + LF

7.2:   Terminal software

Most of the control software may be used with the AR-110 for settings.

Please refer to an instruction manual for using the software.

7.3:   Settings

1. Run the software.
2. Set the terminal setting described at 7.1.
3. Turn the power switch of the AR-110 off.
4. Set the **HOLD** switch to **OFF**.
5. While holding the **TX** switch of the AR-110, turn the power switch **ON**.
6. Then the following message appears on the monitor screen.

    SetupMode

    AR11>

    If the above message does not appear on the monitor screen, press the
    ENTER key of the PC keyboard several times until the above message
    appears.
7. Using the command reference, perform the command settings.
8. After all command settings are completed, turn the power switch of the AR-110
    OFF, and then close the control program.

7.4: Main settings

7.4.1: Radio Mode

AFC Command

When the radio is used in the **SSB** mode, set this command to **ON**.
In all other modes such as **FM** mode or **AM** mode, set this command to **OFF**.

Factory default setting: **OFF**

ATX Command

When the **RX** switch is used as a transmit request, then the **ATX** command must be set to **ON**. Otherwise, set it to **OFF**.

Factory default setting: **ON**

DTM Command

When the **DTMF** function is used, then set it to **ON**.

Factory default setting: **ON**

IDN Command

To communicate with specific AR-110, set it any number other than **12**.
To communicate with all AR-110, then set it to **12**.

Factory default setting: **ON**

7.4.2: Telephone mode

When a modem or (2 wire) telephone line is used, the following settings must be made.

ATH Command

To activate the auto receive function at the receive side of the AR-110, set this command to ON.

Factory default setting: **ON**

ATX Command

To use the **RX** switch of the AR-110 is used as a receive request, set this command to **ON**.

Factory default setting: **ON**

PHO Command

To set the telephone number to be dialed, use this command.

8. Specifications

Video mode	Input	NTSC (4Fsc)
	Output	NTSC 75 ohm 1 V p-p

Radio mode   Input level   0 dBs+10 ~ -30 dB

Telephone mode   Input level   -6 ~ -30 dBm

Mode   Fast mode   352 x 240 pixels
                           Normal mode 352 x 240 pixels
                           Fine mode   736 x 480 pixels
                           Digital color mode 736 x 480 pixels

Modulation method	Analog	Digital VCO modulation by DSP
	Digital	Adaptive JPEG

Color decode   DSP decoding

Power requirements   12 V DC nominal (11.7 ~ 15.8 V DC) Ripple: Less than 100 mV

Current drain   200 mA maximum (at 12 V DC)
                    750 mA maximum (at 12 V DC with PC card)

Dimensions   100 (w) x 55 (h) x 200 (d) (mm) (Projections not included)

Operating temperature   0 ~ 50 degrees Celsius (32 to 144   degree Fahrenheit)

9. Interface

A proper wiring to the cables and connectors are required to operate the AR-110.

9.1: Radio cable

The radio cable connects between the RADIO connector of the AR-110 and the radio.

View from plug connection side
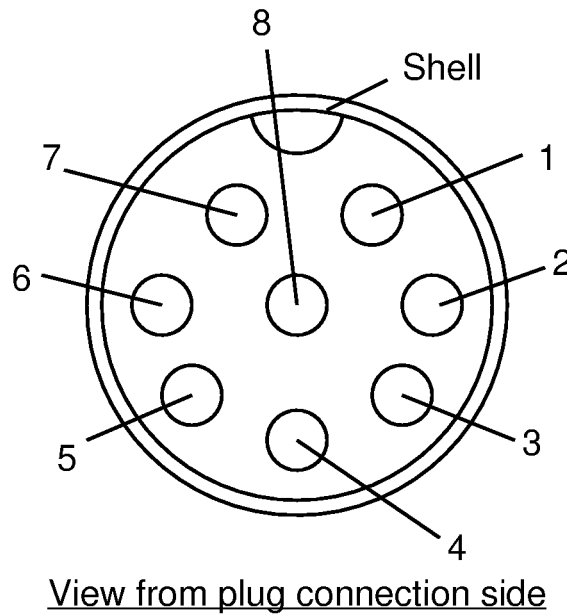
Pin #	Signal	Cable color	Description
1	MIC OUT	RED	Connect to the microphone input of the radio
2	MIC GND	GRAY	Connect to the microphone ground of the radio
3	PTT	GREEN	Connect to the PTT output of the radio
4	SP IN	WHITE	Connect to the speaker output of the radio
5	GND	SCHIELD	Connect to the ground terminal of the radio
6 ~ 8	NC	N/A	No connection

9.2: MIC Connector

The AR-110 does not come with a microphone, and therefore, you must prepare one. The following is a description of the microphone connector.

View from plug connection side
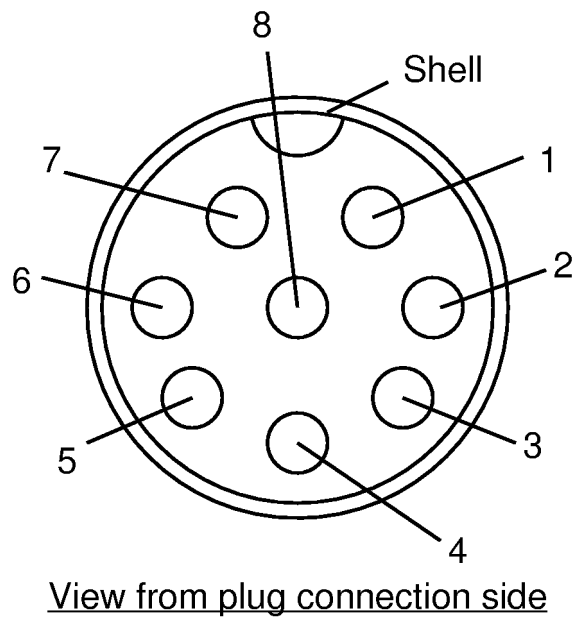
Pin	Signal	Description
1	MIC BIAS	A power source for an electlet condenser type microphone
2	MIC IN	Microphone signal input
3	MIC GND	Microphone ground
4	MIC PTT	PTT input
5	MIC PTT GND	PTT ground input
6 ~ 8	NC	No connection
Shell		Chassis ground

9.3: Power supply

Prepare a regulated power supply to operate the AR-110. Beware of its polarity.   **Black**   --- Negative (-)   **Red** --- Positive (+)

10. Optional accessories

The following accessories are available as an option.

- Control software program
  Control program to control transmit/receive through PC
- Wired Remote controller
- AR-T110 Analog Telephone interface
- AC adapter

11. Command reference

11.1: Command format

[Example]   DAT 011106 (CR)

DAT --- Command

011106 --- parameter

(CR)   ---- Hit the RETURN key of the keyboard

[Note] One space must be inserted between the command the parameter.

Command + (CR) will display the current parameter settings.

11.2: Command parameter

To execute each command, all parameters must be entered within its range
as specified in the manual.

11.3: Operating mode

The following is a command to select the operating mode of the AR-110.

DIGITAL   ---   Use a modem to send/receive the picture

RADIO   ---   Use a radio to send/receive the picture

TEL   ---   Use a telephone line (with an optional telephone

interface) to send/receive the picture

11.4:   Command List (in Alphabetical order)

11.5: Command details

11.5.1: Communication command

AFC

Function	AFC (Automatic Frequency Control)
Format	**AFC ON** or **AFC OFF**
Parameter	ON: Activate the **AFC** function OFF: Deactivate the **AFC** function
Description	This function is available in the **RADIO** mode. In the **SSB** (Single Side Band) mode, it <u>MUST</u> be set to **ON**. In the **FM** (Frequency Modulation) mode, the **AFC** command can be set to **OFF**.
Default	**OFF**

ATH

Function	Auto receive function
Format	**ATH ON** or **ATH OFF**
Parameter	ON: Activate the **Auto receive** function OFF: Deactivate the **Auto receive** function
Description	This function is available in the **DIGITAL** mode and the **TEL** (Telephone) mode. When activated, the AR-110 starts receiving the picture on detecting a call.
Default	**ON**

ATS

Function	Auto transmit function
Format	**ATS ON** or **ATS OFF**
Parameter	ON: Activate the **ATS** function OFF: Deactivate the **ATS** function
Description	When activated, the AR-110 will take in the picture and send it automatically as soon as turning the power switch on. In the **RADIO** mode, the picture will be sent via the radio equipment.

In the **DIGITAL** mode, the AR-110 dials the preset phone number (set by
the **PHO** command), and then send it via a modem

In the **TEL** (telephone) mode, the AR-110 dials the preset phone number
(set by the **PHO** command), and then send it via a phone line.

Default	**OFF**

ATX	
Function	Auto Transmit request
Format	**ATX ON** or **ATX OFF**
Parameter	ON: Send the **Transmit request** OFF: Does not send the **Transmit request**
Description	When this function is activated, pushing the **RX** switch of the AR-110 will send the transmit request to the sender. In the **DIGITAL** mode, the request will be sent to the sender by dialing the number. In the **RADIO** mode, the request will be sent to the sender by sending the **DTMF** tones via a radio. In the **TEL** (Telephone) mode, the request will be sent to the sender by sending the **DTMF** tones via a phone line. To activate this function in the **RADIO** mode and the **TEL** mode, the **DTM** command <u>MUST</u> be set to **ON**.
Default	**ON**

DTM	
Function	DTMF (Dual Tone Multiple Frequency) tone control
Format	**DTM ON** or **DTM OFF**
Parameter	ON: Activate the **DTM** function OFF: Deactivate the **DTM** function
Description	This function is available in the **RADIO** mode or **TEL** (Telephone) mode.
Default	**ON**

IDN

Function	ID (Identification) number setting
Format	**IDN nn**
Parameter	nn: 00 ~ 15
Description	In the **RADIO** mode, the AR-110 is capable of selective calling. When an **ID** number of any AR-110 are set to the same, the picture sent from the sender can be received by any receive party. However, if the **ID** number is not same as the sender, the picture cannot be received even though the receive frequency is the same as the sender. The **ID** number **12** is a wild card. When the **ID** number of the receiver is set to **12**, it can send/receive the picture to/from any other parties.
Default	**12**

LOO

Function	Loop (Auto repeat transmit) function
Format	**LOO ON** or **LOO OFF**
Parameter	ON: Activate the **Loop** function OFF: Deactivate the **Loop** function
Description	This function is available in the **DIGITAL** mode and the **TEL** mode. Once activated, the picture in the transmit side of the AR-110 will be sent repeatedly in response to the transmit request from the receiver.
Default	**OFF**

RCN

Function	Ring Counter
Format	**RCN n**
Parameter	n: 1 ~ 9
Description	This function is used in the **TEL** mode. The **RCN** command specifies a number of ring before answering to the call. In the **DIGITAL** mode, however, the AR-110 will respond to the call immediately, and therefore, the parameter cannot be changed.
Default	**2**

11.5.2: Picture command

FIN

Function	Resolution level setting in the FINE mode
Format	**FIN n**
Parameter	n: 0 ~ 3
Description	This function is available in the **RADIO** mode and the **TEL** mode. This command is to set a resolution of the picture. A higher parameter will have a high resolution picture, however, it takes longer to send it.
Default	**2**

IME

Function	Super impose (characters)
Format	**IME ON** or **IME OFF**
Parameter	ON: Activate the **IME** function OFF: Deactivate the **IME** function
Description	This function is available in the **RADIO** mode. When activated, characters in the memory will be super imposed on the picture.
Default	**OFF**

ITI

Function	Super impose (clock)
Format	**ITI ON** or **ITI OFF**
Parameter	ON: Activate the **ITI** function OFF: Deactivate the **ITI** function
Description	This function is available in the **RADIO** mode. When activated, a current time will be displayed on the picture.
Default	**OFF**

MES

Function	Message input for super impose
Format	**MES nnn….**
Parameter	n: 6 characters maximum
Description	This function is available in the **RADIO** mode only.
Default	none (empty)

11.5.3: Modem and telephone command

ATI

Function	Initialize the modem
Format	**ATI sss……**
Parameter	sss…..: Up to 26 characters of command
Description	This function is available in the **DIGITAL** mode only. A space cannot be used.
Default	**ATS0=0S7=55**

PHO

Function	Dial number setting
Format	**PHO nnn…**
Parameter	nnn…: Up to 16 numbers
Description	In the **DIGITAL** mode, any numbers (except space) can be entered. Please refer to an instruction manual of your modem for detail. In the **TEL** mode, any number (0 ~ 9) can be entered. Before using the AR-110 in the **DIGITAL** mode or **TEL** mode, any phone number must be first stored on the memory.
Default	**000**

TOU	
Function	Modem Negotiation Time Out Timer setting
Format	**TOU nnn**
Parameter	nnn: 000 ~ 199
Description	This function is available in the **DIGITAL** mode.
	The **TOU** command set the time out timer of the modem between 0 ~ 199 (seconds).
	The parameter has be a three digit, and therefore, any number smaller than 100 (seconds) must add 0 (or 00) ahead of the number.
	[Example] 005 (t seconds), 099 (99 seconds)
Default	**122**

11.5.4: Date / Time command

DAT	
Function	Calendar date setting
Format	**DAT YYMMDD**
Parameter	YY: Year 00 ~ 99
	MM: Month 00 ~ 12
	DD: Date 01 ~ 31
Description	All six digits must be entered to this command.
	Any invalid number (invalid month or day) must not be entered.
	[Example] March 28, 2002
	DAT 020328

TIM	
Function	Current time setting
Format	**TIM HHMMSS**
Parameter	HH: hour (00 ~ 23)
	MM: minute (00 ~ 59)
	SS: second (00 ~ 59)
Description	All six digits must be entered to this command.
	Any invalid number must not be entered.
	[Example] 14:49:03
	TIM 144903.

FCC statement

AOR, LTD.

2-6-4, Misuji, Taitok-Ku

Tokyo, 111-0055, Japan

http://www.aorja.com

AOR USA, INC.

20655 S. Western Ave. Suite 112

Torrance, CA 90501, U.S.A.

 Phone: 310-787-8615

 Fax: 310-787-8619

http://www.aorusa.com

  info@aorusa.com

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