



INSTRUCTION MANUAL

HF/50 MHz TRANSCEIVER

IC-736

HF TRANSCEIVER

IC-738



Icom Inc.

IMPORTANT

READ THIS INSTRUCTION MANUAL CAREFULLY before attempting to operate the transceiver.

SAVE THIS INSTRUCTION MANUAL— This instruction manual contains important safety and operating instructions for the IC-736 and IC-738.

PRECAUTIONS for the IC-736

⚠ **DISCONNECT** the AC power cable from the transceiver, and wait for a few minutes before performing AC fuse replacement or any internal work.

⚠ **NEVER** apply AC voltage that exceeds the suggested voltage for each version. This could cause a fire or ruin the transceiver.

⚠ **NEVER** use non-rated fuses. Non-rated fuses could cause a fire or ruin the transceiver.

⚠ **NEVER** let metal, wire or other objects touch any internal components.

⚠ **NEVER** expose the transceiver to rain, snow or any liquids.

NEVER allow children to touch the transceiver.

AVOID using or placing the transceiver in areas with temperatures below -10°C ($+14^{\circ}\text{F}$) or above $+60^{\circ}\text{C}$ ($+140^{\circ}\text{F}$).

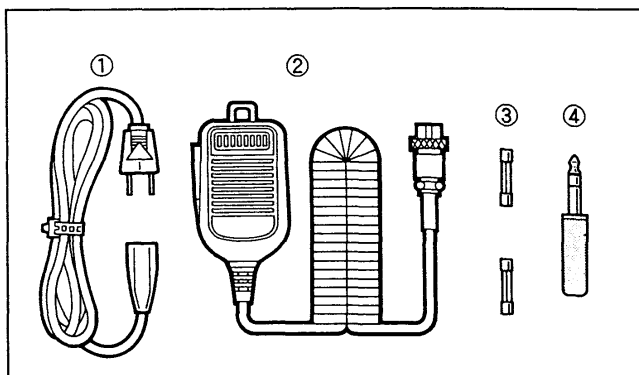
AVOID placing the transceiver in excessively dusty environments or in direct sunlight.

AVOID placing the transceiver against walls or putting anything on top of the transceiver. This will obstruct heat dissipation.

In maritime mobile operation, keep the transceiver and microphone as far away as possible from the magnetic navigation compass to prevent erroneous indications.

BE CAREFUL! The heatsink will become hot when operating the transceiver continuously for long periods.

UNPACKING of the IC-736



Accessories included with the IC-736:	Qty.
① AC power cable	1
② Hand microphone (HM-36)	1
③ Spare fuses*	2
④ CW keyer plug	1

*10 A FGMB fuse for 100 – 120 V versions

5 A high breaking capacity fuse for 220 – 240 V versions

EXPLICIT DEFINITIONS

WORD	DEFINITION
⚠ WARNING	Personal injury, fire hazard or electric shock may occur.
CAUTION	Equipment damage may occur.
NOTE	If disregarded, inconvenience only. No risk of personal injury, fire or electric shock.

The explicit definitions described at left apply to this instruction manual.

PRECAUTIONS for the IC-738

⚠ NEVER apply AC to the [DC 13.8V] socket on the transceiver rear panel. This could cause a fire or damage the transceiver.

NEVER apply more than 16 V DC to the [DC 13.8V] socket on the transceiver rear panel. This could cause a fire or damage the transceiver.

NEVER use non-rated fuses. Non-rated fuses could cause a fire or ruin the transceiver.

NEVER let metal, wire or other objects touch any internal components.

NEVER expose the transceiver to rain, snow or any liquids.

NEVER allow children to touch the transceiver.

AVOID using or placing the transceiver in areas with temperatures below -10°C ($+14^{\circ}\text{F}$) or above $+60^{\circ}\text{C}$ ($+140^{\circ}\text{F}$).

AVOID placing the transceiver in excessively dusty environments or in direct sunlight.

AVOID placing the transceiver against walls or putting anything on top of the transceiver. This will obstruct heat dissipation.

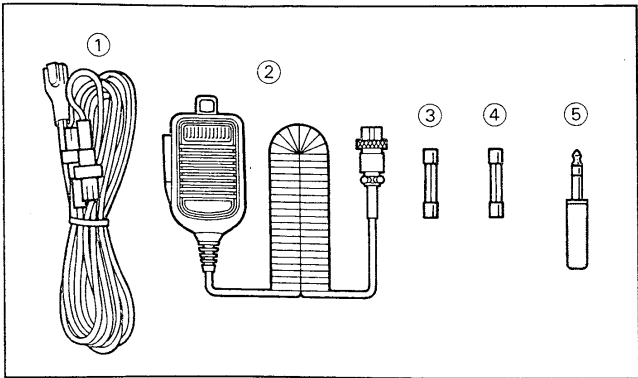
In any mobile operation, **DO NOT** operate the transceiver without running the vehicle's engine. The vehicle's battery will quickly run out if the transceiver power is ON while your vehicle's engine is OFF.

In maritime mobile operation, keep the transceiver and microphone as far away as possible from the magnetic navigation compass to prevent erroneous indications.

Make sure the transceiver power is OFF before starting the vehicle. This will avoid possible damage to the transceiver by ignition voltage spikes.

BE CAREFUL! The heatsink will become hot when operating the transceiver continuously for long periods.

UNPACKING of the IC-738



Accessories included with the IC-738:	Qty.
① DC power cable (OPC-025A)	1
② Hand microphone (HM-36)	1
③ Spare fuse (FGB 20 A)	1
④ Spare fuse (FGB 4 A)	1
⑤ CW keyer plug	1

TABLE OF CONTENTS

IMPORTANT	i	5 MEMORY CHANNELS	39 – 44
PRECAUTIONS for the IC-736	i	■ Memory channels	39
UNPACKING of the IC-736	i	■ Memory channel selection	39
EXPLICIT DEFINITIONS	ii	■ Memory channel programming	40
PRECAUTIONS for the IC-738	ii	■ Frequency transferring	41
UNPACKING of the IC-738	ii	■ Memory clearing	41
TABLE OF CONTENTS	iii	■ Scan edge memory channels	42
INDEX	iv	■ Split memory channels (for accessing a repeater)	43
FRONT PANEL INDEX	iv	6 SCANS	45 – 46
1 PANEL DESCRIPTION	1 – 10	■ Scan types	45
■ Front panel	1	■ Pre-operation	45
■ Rear panel	7	■ Programmed scan operation	46
■ Function display	9	■ Memory scan operation	46
■ Microphone (HM-36)	10	■ Select memory scan operation	46
2 INSTALLATION AND CONNECTIONS	11 – 16	7 MAINTENANCE AND ADJUSTMENT	47 – 52
■ Unpacking	11	■ Frequency calibration (approximate)	47
■ Selecting a location	11	■ Main dial brake adjustment	47
■ Grounding	11	■ Fuse replacement (IC-736)	48
■ Antenna	11	■ Fuse replacement (IC-738)	48
■ Connections diagram	12	■ Opening the transceiver's case	49
■ DC power supply connections (IC-738)	13	■ LCD dimmer adjustment	49
■ Linear amplifier connections	14	■ AC power voltage selection (IC-736)	50
■ External antenna selector or antenna tuner connections	15	■ Tuner operating condition	50
■ AFSK terminal unit connections	16	■ PA idling current adjustment (IC-738)	51
3 BASIC OPERATION	17 – 26	■ Lithium backup battery	52
■ When first applying power	17	■ Cleaning	52
■ Initial settings	17	8 OPTIONS INSTALLATION	53 – 54
■ Basic operation	18	■ CW narrow filters	53
■ VFO description	19	■ UT-30 PROGRAMMABLE TONE ENCODER UNIT	53
■ VFO mode and memory mode	19	■ CR-282 HIGH-STABILITY CRYSTAL UNIT	54
■ Frequency setting with the main dial	21	■ MB-49 MOBILE MOUNTING BRACKET	54
■ Direct frequency entry with the keypad	21	9 TROUBLESHOOTING	55 – 56
■ Advanced tuning functions	22	10 INTERNAL VIEWS	57 – 58
■ Receiving	23	■ Main and PLL units	57
■ Transmitting	25	■ Filter and Reg units (IC-736)	58
4 FUNCTION OPERATIONS	27 – 38	■ Filter unit (IC-738)	58
■ Memo pad operation	27	11 SPECIFICATIONS	59
■ RIT and Δ TX	28	12 OPTIONS	60 – 62
■ Split frequency operation	29	SCHEMATIC AND BLOCK DIAGRAMS	SEPARATE
■ Quick split function	29		
■ VOX operation	30		
■ Meter function	30		
■ PBT operation	31		
■ Notch operation	31		
■ Set mode operation	32		
■ Band memory (for automatic antenna selection)	36		
■ Remote jack (CI-V) information	36		
■ Antenna tuner operation	37		
■ Optional external tuner operation	38		

Technical information

• ACC sockets	8
• Microphone connector and HM-36 schematic diagram	10

INDEX

A

AC power voltage selection 50
 AF gain 2, 23
 AFSK 8, 10, 16, 24, 26
 AGC (Automatic Gain Control) 2, 23
 ALC (Automatic Level Control) 14, 30
 Accessory socket 7, 8
 Antenna connector 8, 11
 Antenna switch 2, 34, 36
 Antenna tuner 1, 37, 38
 Attenuator 2, 23

B

Basic operation 18
 Beep 32
 Break-in 1, 25

C

CI-V 7, 35, 36
 CPU resetting 17
 CW narrow filter 33, 53
 Compressor 2, 7, 25

D

DC power supply 8, 13
 ΔTX 5, 28
 Dial lock 3, 23, 25, 35
 Display dimmer adjustment 49

E

Electronic CW keyer 2, 7, 25
 External antenna selector 15
 External antenna tuner 15, 38

F

Frequency calibration 47
 Full break-in 1, 25
 Fuse replacement 48

G

Grounding 8, 11

H

High-stability crystal unit 54

K

Key speed 2, 25

L

LCD dimmer adjustment 49
 Linear amplifier 14
 Lithium backup battery 52
 Lock 3, 23, 25, 35

M

Main dial brake 47
 Memo pad 3, 27, 34
 Memory channel 6, 19, 39
 Memory scan 46
 Meter 1, 30
 Microphone 1, 10
 Microphone gain 2, 25
 Mobile mounting bracket 54

N

Noise blanker 2, 23
 Notch filter 5, 6, 31

O

1 Hz tuning step 4, 22
 Option 60–62

P

PA idling current 51
 PBT (PassBand Tuning) 6, 31
 PTT (Push-To-Talk) 10, 18
 Preamplifier 2, 23
 Programmed scan 46

Q

Quick split function 29
 Quick tuning step 4, 22

R

RF gain control 3, 23
 RF power control 3, 25
 RIT (Receive Incremental Tuning) 5, 28
 Repeater 43
 Resetting 17

S

S-meter 2
 SWR (Standing Wave Ratio) 11, 30
 Scan 6, 45
 Scan edge 42, 46
 Select memory 6, 46
 Select memory scan 46
 Semi break-in 1, 25
 Set mode 32–35
 Specifications 59
 Speech compressor 2, 7, 25
 Split memory channel 43
 Split operation 4, 29
 Squelch 2, 23

T

Tone encoder 4, 43, 53
 Transmit meter 1, 30
 Troubleshooting 55

U

Unpacking i, ii

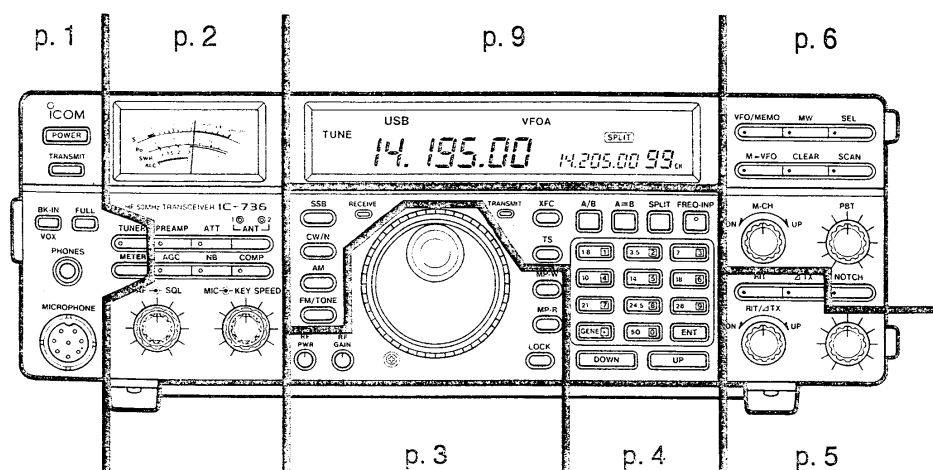
V

VOX (Voice Operated Relay) 1, 7, 25, 30
 Volume control 2, 23

X

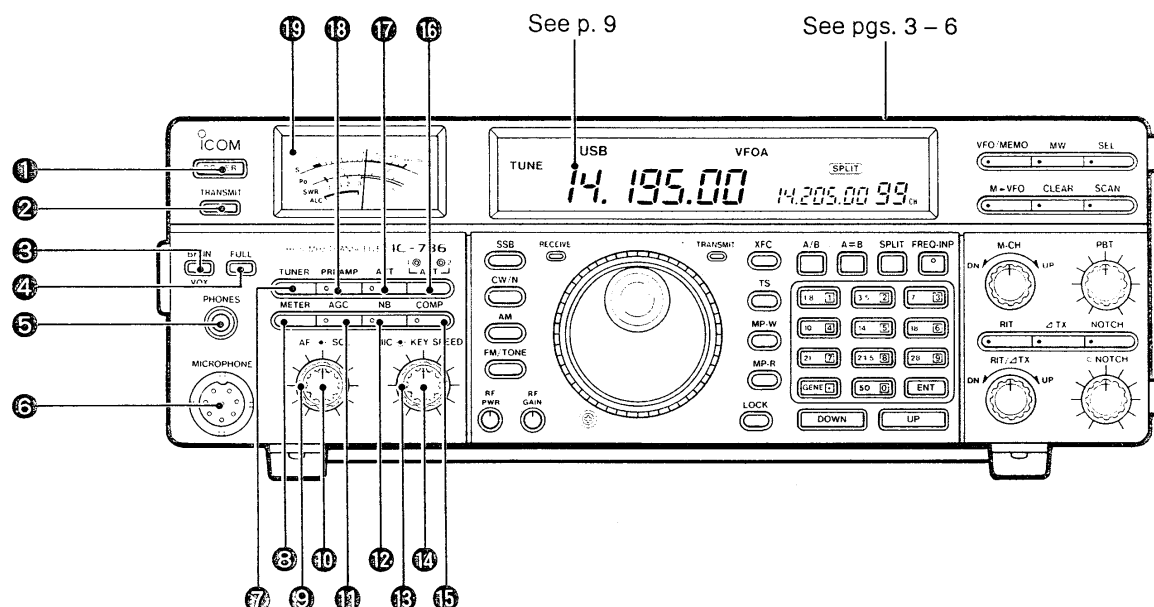
XFC (Transmit Frequency Check) 4, 29, 30

FRONT PANEL INDEX



1 PANEL DESCRIPTION

Front panel



- 1 POWER SWITCH [POWER]** (pgs. 23, 25)
Turns power ON and OFF.



- 2 TRANSMIT SWITCH [TRANSMIT]** (p. 25)
Selects transmitting or receiving.



- 3 BREAK-IN/VOX SWITCH [BK-IN/VOX]**
(pgs. 25, 30)
Turns the break-in operation for CW mode and
VOX function for phone (SSB, AM and FM) opera-
tion ON and OFF.



FUNCTION

The **VOX function** (voice operated transmission) starts transmission without pushing the transmit switch or PTT switch when you speak into the microphone; then, automatically returns to receive when you stop speaking.

- 4 FULL BREAK-IN SWITCH [FULL]** (p. 25)
Selects full break-in or semi break-in operation for
CW operation when [BK-IN/VOX] is pushed IN.



FUNCTION

Both **semi** and **full break-in** toggle transmit and receive with CW keying. Full break-in (QSK) can monitor the receive signal during keying.

- 5 HEADPHONE JACK [PHONES]** (p. 23)
Accepts headphones.

- Headphones with 4 – 16 Ω impedance can be used.
- When headphones are connected, the internal speaker or connected external speaker does not function.

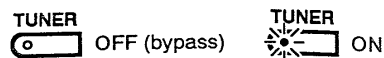
- 6 MICROPHONE CONNECTOR [MICROPHONE]**
Accepts the supplied microphone.

- An optional Icom desktop microphone can be used.
- See p. 10 for microphone connector information.

- 7 ANTENNA TUNER SWITCH [TUNER]** (pgs. 37, 38)
-Turns the antenna tuner ON or OFF (bypass)
when pushed momentarily.

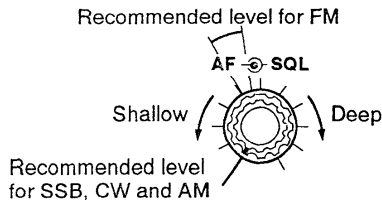
-Starts to tune the antenna tuner manually when pushed and held.

- When the tuner cannot tune the antenna, the tuning circuit is bypassed automatically after 20 sec.



- 8 METER SWITCH [METER]** (p. 30)
Selects the meter function as a power, SWR or
ALC meter while transmitting.
- The meter activates only as an S-meter while receiving.

- 9 **SQUELCH CONTROL [SQL]** (outer control) (p. 23)
Adjusts the squelch threshold level.



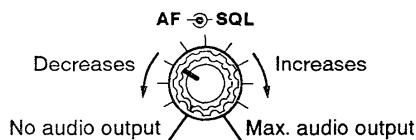
FUNCTION

The **squelch** removes noise output from the speaker (closed condition) when no signal is received. The squelch is particularly effective for FM. It is also available for other modes.

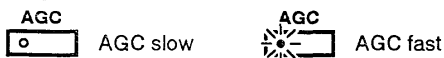
SETTING PROCEDURE

Squelch setting: When operating in FM, first rotate the control fully counterclockwise. Then, rotate the control clockwise to the point where the noise just disappears. This is the best position. The squelch does not open for weak signals when it is set too deep.

- 10 **AF GAIN CONTROL [AF]** (inner control) (p. 23)
Varies the audio output level from the speaker.



- 11 **AGC SWITCH [AGC]** (p. 23)
Changes the time constant of the AGC circuit.



FUNCTION

The **AGC** controls receiver gain to produce a constant audio output level even when the received signal strength is varied by fading, etc. Use AGC slow for normal operation and select AGC fast depending on the receiving condition. AGC does not function in FM mode.

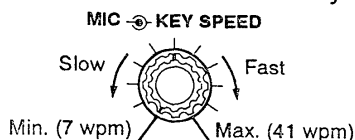
- 12 **NOISE BLANKER SWITCH [NB]** (p. 23)
Turns the noise blanker ON and OFF.



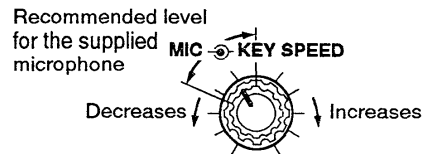
FUNCTION

The **noise blanker** reduces pulse-type noise such as that generated by automobile ignition systems. This function is not effective for AM and FM, or non-pulse-type noise.

- 13 **ELECTRONIC CW KEYSER SPEED CONTROL [KEY SPEED]** (outer control) (p. 25)
Adjusts the internal electronic CW keyer's speed.



- 14 **MIC GAIN CONTROL [MIC]** (inner control) (p. 25)
Adjusts microphone input gain.



- 15 **SPEECH COMPRESSOR SWITCH [COMP]** (p. 25)

Turns the speech compressor ON and OFF.

- The compression level must be adjusted properly. See 64 on the rear panel for details. (p. 7)

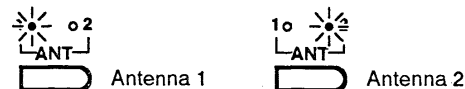


FUNCTION

The **speech compressor** compresses the transmitter audio input to increase the average audio output level. Therefore, talk power is increased. This function is effective for long distance communication or when propagation conditions are poor.

- 16 **ANTENNA SWITCH [ANT]** (pgs. 34, 36)
Selects antenna 1 or 2.

- Antenna selection can be programmed depending on the band selection such as above 21 MHz band and below 18 MHz band, etc.



- 17 **ATTENUATOR SWITCH [ATT]** (p. 23)
Turns the 20 dB attenuator ON and OFF.



FUNCTION

The **attenuator** prevents a desired signal from distorting when very strong signals are near the desired frequency or when very strong electric fields, such as from a broadcasting station are near your location.

- 18 **PREAMP SWITCH [PREAMP]** (p. 23)
Turns the preamp ON and OFF.

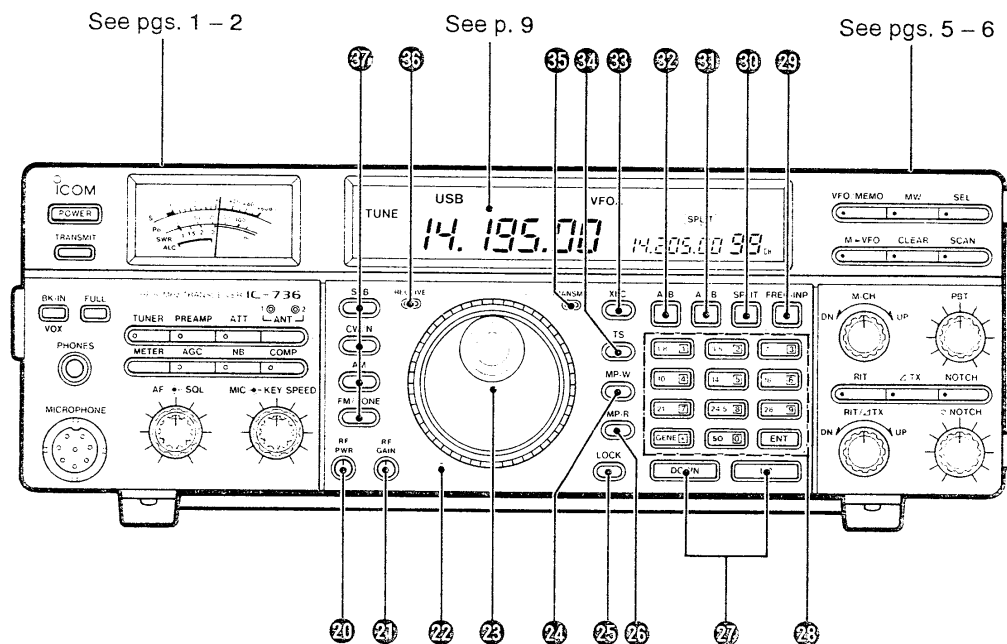


FUNCTION

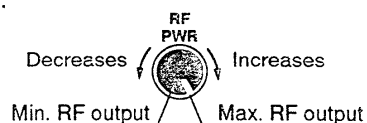
The **preamp** amplifies received signals in the front end circuit to improve the S/N ratio and sensitivity. Turn this function ON when receiving weak signals.

- 19 **S/RF METER** (p. 30)
Shows the signal strength while receiving. Shows the relative output power, SWR or ALC levels while transmitting.

1 PANEL DESCRIPTION

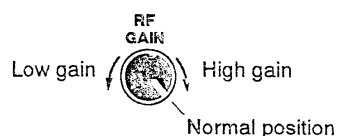


- 20 RF POWER CONTROL [RF PWR]** (p. 25)
Continuously varies the RF output power from minimum (5 W for QRP operation) to maximum (100 W).



MODE	Max. RF output	Min. RF output
SSB	100 W	5 W
CW	100 W	5 W
FM	100 W	5 W
AM	40 W	4 W

- 21 RF GAIN CONTROL [RF GAIN]** (p. 23)
Adjusts the receiver gain.
• This control should be set to the maximum clockwise position for normal use.



- 22 BRAKE ADJUSTMENT SCREW** (p. 47)
Adjusts the main dial tension.



- 23 MAIN DIAL** (p. 21)
Changes the displayed frequency.
- 24 MEMO PAD-WRITE SWITCH [MP-W]** (p. 27)
Programs the displayed frequency and operating mode into a memo pad.
• The 5 most recent entries remain in memo pads.
• The memo pad capacity can be expanded from 5 to 10 in the set mode for your convenience. (p. 34)
- 25 DIAL LOCK SWITCH [LOCK]** (pgs. 23, 25)
Turns the dial lock function ON and OFF.
• The dial lock function electronically locks the main dial.
• "LOCK" appears in the function display while the function is ON.
• The lock function can be deactivated only when changing the transmit frequency for split frequency operation using the set mode. (p. 35)
- 26 MEMO PAD-READ SWITCH [MP-R]** (p. 27)
Each push calls up a frequency and operating mode in a memo pad. The 5 most recently programmed frequencies and operating modes can be recalled, starting from the most recent.
• The memo pad capacity can be expanded from 5 to 10 in the set mode for your convenience. (p. 34)

Count on us!

