



INSTRUCTION MANUAL

H16/U16 U2 V100/U400 V200/U200 V201
PROGRAMMING/CLONING

**MAINTENANCE
SET**

EX-494 PROGRAMMER

To Remove Priority Scan
BE IN "PROGRAM MODE" "F" SCAN
Function

Gerard 7/27

FOREWORD

This manual explains in detail how to program each of the available functions in the following transceivers:

IC-H16/IC-U16
IC-U2
IC-V100/IC-U400
IC-V200/IC-U200
IC-V201

If you have a MASTER transceiver in your Service Center, it is not necessary to open other transceivers in stock when customers require transceiver programming.

PROGRAMMING NOTE

All parameters except in STEP SCAN (see p. 9) can be cloned from transceivers with new CPUs to those with previously installed CPUs. New CPUs are installed in transceivers starting with the serial numbers below. (IC-U2, IC-V200, IC-U200 and IC-V201 have new CPUs from the beginning but those have no scan function.)

IC-H16 (U.S.A. version) : 8401 IC-V100 : 4101
IC-H16 (U.K. version) : 1201 IC-U400 : 3601
IC-U16 (U.S.A. version) : 8501
IC-U16 (U.K. version) : 1001

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SECTION 1 CONSTRUCTION OF THE TRANSCEIVERS

The transceivers have two major modes: OPERATING MODE and PROGRAMMING MODE:

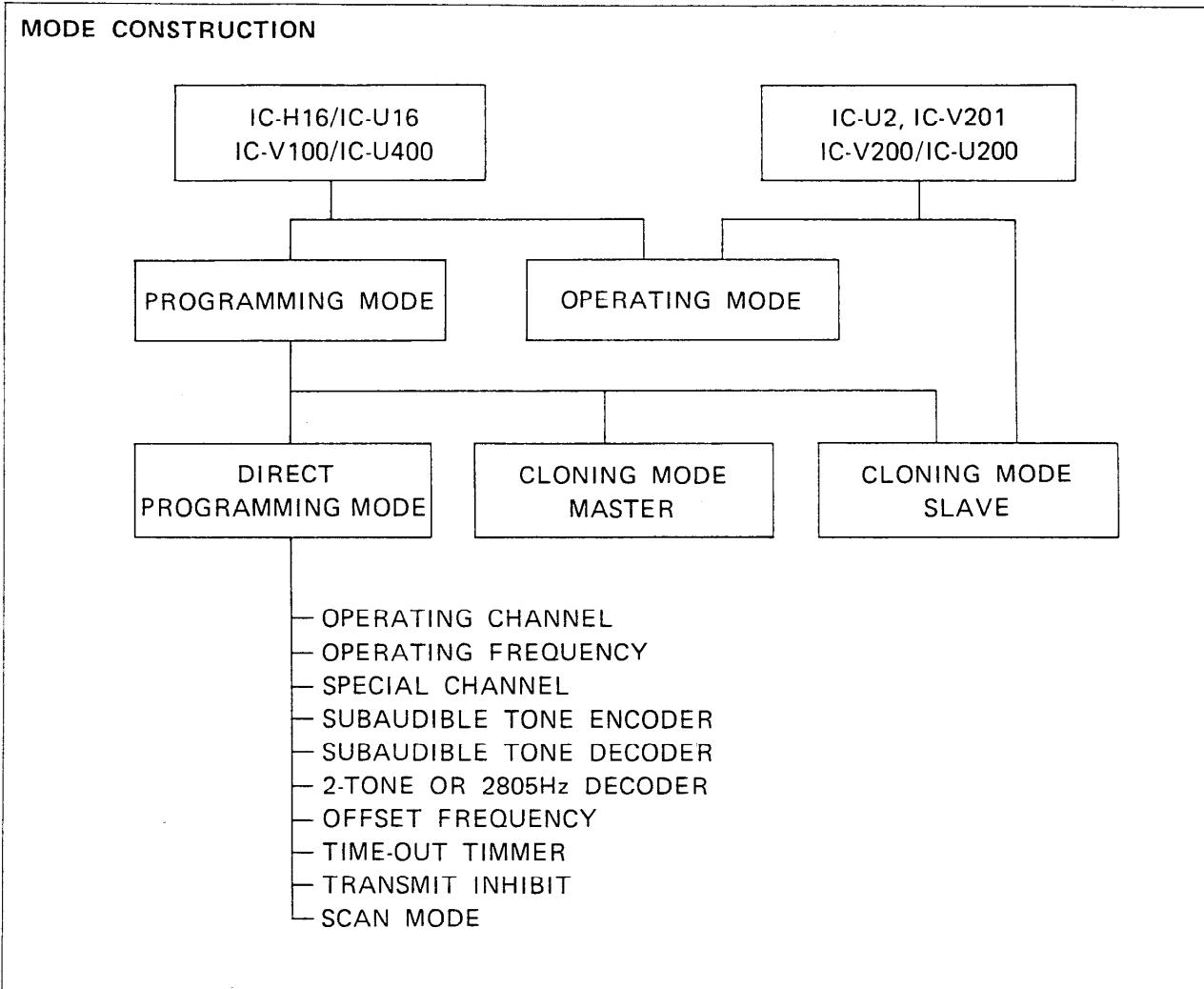
OPERATING MODE : This mode is used for normal transmitting and receiving by users.

PROGRAMMING MODE : This mode is used for programming the parameters of each channel such as frequency, offset frequency, subaudible tone numbers, etc., via by the DIRECT PROGRAMMING MODE or ICOM's exclusive CLONING MODE.

(1) DIRECT PROGRAMMING MODE All parameters can be directly programmed in PROGRAMMING MODE by using the 10-key board on the transceiver or the EX-494 EXTERNAL KEYBOARD.

(2) CLONING MODE Identical parameters in the MASTER transceiver can be programmed into the SLAVE transceiver by the ICOM's exclusive cloning system. This system allows you to instantly transfer programmed information.

• The IC-U2, IC-V200, IC-U200 and IC-V201 have no direct programming mode and cannot be used the MASTER transceiver.



SECTION 2 SETTING THE DIRECT PROGRAMMING MODE

The transceiver you wish to program must be switched from OPERATING MODE to DIRECT PROGRAMMING MODE before any programming can be performed.

The IC-U2, IC-V200, IC-U200 and IC-V201 are programmed only by ICOM's exclusive new cloning system. See SECTION 4 CLONING MODE.

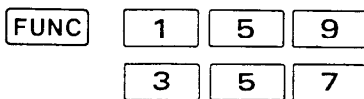
Observe the following instructions to activate DIRECT PROGRAMMING MODE:

2 - 1 IC-H16/IC-U16

(1) PRESET

- 1) Remove the front and rear covers of the transceiver. (Fig. 1 and 2)
- 2) Unplug P1 on the LOGIC UNIT. (Fig. 3)
- 3) Replace the front and rear covers and then turn the transceiver ON.

(2) SETTING



- 1) Push and hold the [FUNC] SWITCH, and then push the following keys in sequence:

[1], [5], [9], [3], [5], [7]

- Two dots appear between "ch" and the channel number on the FUNCTION DISPLAY.

- 2) Release the [FUNC] SWITCH. PROGRAMMING MODE is now activated.
- 3) After approximately 60 seconds the transceiver returns to OPERATING MODE automatically if no key has been pushed.
- 4) To return to operating mode, push and hold the [FUNC] SWITCH, and then push the [CLR] KEY. Or, turn the transceiver OFF and ON.

NOTE: To prevent additional programming from the user side of the transceiver **DO NOT** forget to re-plug P1 on the LOGIC UNIT.

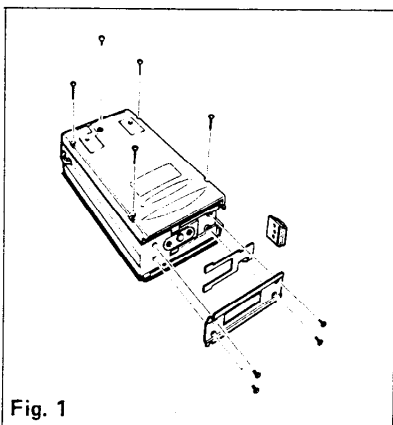


Fig. 1

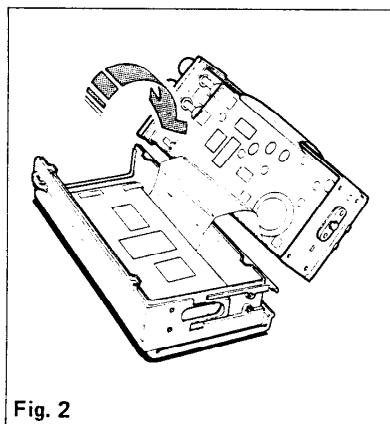


Fig. 2

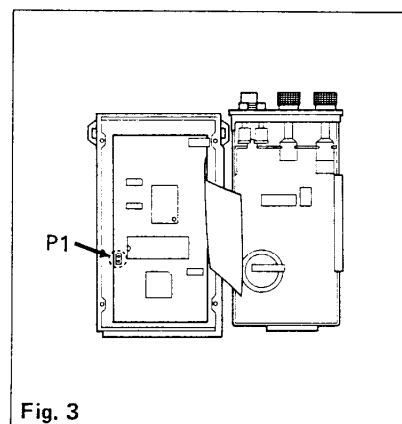


Fig. 3

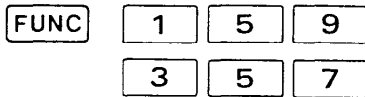
2 - 2 IC-V100/IC-U400

(1) Pre-set

- 1) Remove the two hex socket screws from the front panel, and remove the CONTROL HEAD. (Fig. 4)
- 2) Remove the two screws from the back of the CONTROL HEAD, and remove the control head cover. (Fig. 4)
- 3) Plug the connector from the EX-494 EXTERNAL KEYBOARD into J4. (Fig. 5)
- 4) Re-attach the CONTROL HEAD to the main body. (Fig. 6)

(2) Setting

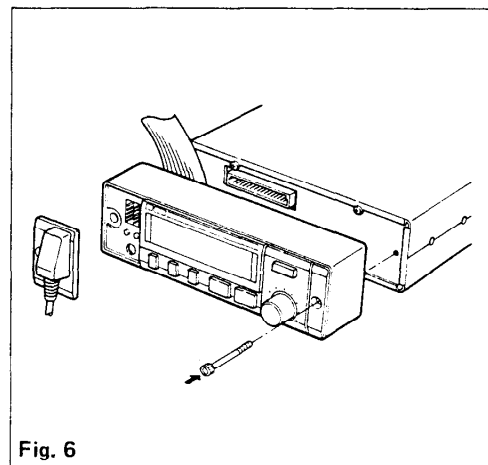
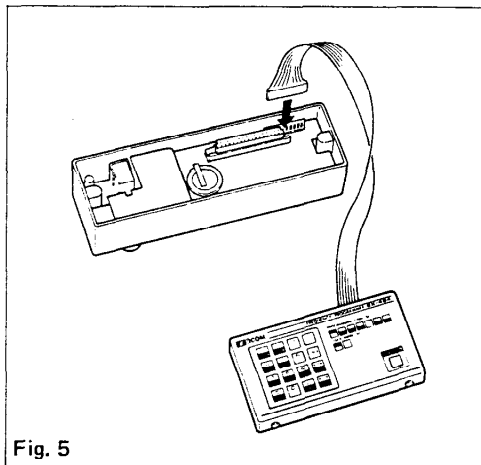
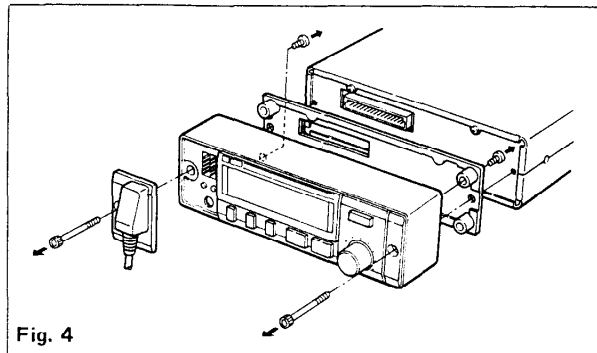
- 1) Push and hold the [FUNC] SWITCH, and then push the following keys in sequence:



[1], [5], [9], [3], [5], [7]

- Two dots appear between "ch" and the channel number on the FUNCTION DISPLAY.

- 2) Release the [FUNC] SWITCH. PROGRAMMING MODE is now activated.
- 3) To return to operating mode, push and hold the [FUNC] SWITCH, and then push the [CLR] KEY. Or, turn the transceiver OFF and ON.



3 - 1 SETTING THE PROGRAMMING CHANNEL

Each parameter must be programmed into an operating channel. Following are the instructions for selecting an operating channel.

- 1) Place the transceiver in DIRECT PROGRAMMING MODE. See SECTION 2.
- 2) Enter the required channel number with 1 or 2 digits by using the 10-key board.
 - "ch :" disappears from the FUNCTION DISPLAY, and then entered channel number appears.
 - Channel numbers "1" ~ "16" only are acceptable for the setting.
 - If the channel number cannot be stored, the channel you wish to enter may be used as special channel. To store the number, cancel the special channel and then enter the number again. Refer to SECTION 3 - 3 SETTING SPECIAL CHANNEL NUMBERS.
- 3) Push the [ENT] KEY. "ch :" appears on the FUNCTION DISPLAY. An operating channel is now stored in the transceiver.
- 4) Pushing the [▼] or [▲] KEY also changes an operating channel number.

3 - 2 SETTING THE OPERATING FREQUENCY**FUNC****5**

Each channel must have an operating frequency programmed into memory before the channel can be used.

- 1) Place the transceiver in DIRECT PROGRAMMING MODE. See SECTION 2.
- 2) Push and hold the [FUNC] SWITCH, and then push the [5] KEY.
 - The previous programmed frequency or "00.00" appears on the FUNCTION DISPLAY.
- 3) Still holding the [FUNC] SWITCH down, enter the desired frequency with 6 digits using the 10-key board.
- 4) Push the [ENT] KEY, and then release the [FUNC] SWITCH.
 - The FUNCTION DISPLAY returns to the current channel number displayed.
- 5) To clear the operating frequency (clear the operating channel), hold the [FUNC] SWITCH down and push the [5], [CLR] and [ENT] KEYS.

3 - 3 SETTING SPECIAL CHANNEL NUMBERS

FUNC

7

Special channel numbers from 17 to 99 for storing programmed channels are available. This feature is very useful when operating with other communication systems that use memory channel numbers other than 1 through 16.

These special channel numbers also provide tremendous convenience when communicating with large, multi-frequency systems because different frequencies can be assigned to different memory channels without the need for duplication.

1) Place the transceiver in DIRECT PROGRAMMING MODE. See SECTION 2.

2) Push and hold the [FUNC] SWITCH, and then push the [7] KEY.

- "sch:" and the channel number appear on the FUNCTION DISPLAY.

3) Still holding the [FUNC] SWITCH down, enter a desired special channel number with two digits using the 10-key board.

- If the channel you wish to enter is already used, it is cancelled and the transceiver returns to "0" or the previous special channel.

4) Push the [ENT] KEY, then release the [FUNC] SWITCH.

- The FUNCTION DISPLAY returns to current operating channel displayed.

5) To cancel the special channel, hold the [FUNC] SWITCH down and push the [7], [CLR] and [ENT] KEYS.

3 - 4 SETTING THE SUBAUDIBLE TONE ENCODER

FUNC

1

To contact a station equipped with a subaudible tone system or to access some repeaters, it is necessary to transmit a subaudible tone.

1) Place the transceiver in DIRECT PROGRAMMING MODE. See SECTION 2.

2) Push and hold the [FUNC] SWITCH, and then push the [1] KEY.

- The currently programmed tone number or "0" appears on the FUNCTION DISPLAY.

3) Still holding the [FUNC] SWITCH down, enter the desired tone number with 1 or 2 digits using the 10-Key board. Refer to the SUBAUDIBLE TONE NUMBER CHART on the next page.

4) Push the [ENT] KEY, and then release the [FUNC] SWITCH.

- The FUNCTION DISPLAY returns to the current channel number displayed.

5) To cancel the subaudible tone encoder, hold the [FUNC] SWITCH down and push the [1], [CLR] and [ENT] KEYS.

3 - 5 SETTING THE SUBAUDIBLE TONE DECODER

FUNC

2

This section explains how to program the subaudible tone decoder frequency (receive tone number).

1) Place the transceiver in DIRECT PROGRAMMING MODE. See SECTION 2.

2) Push and hold the [FUNC] SWITCH, and then push the [2] KEY.

- The currently programmed tone number or "0" appears on the FUNCTION DISPLAY.

3) Still holding the [FUNC] SWITCH down, enter the desired tone number with 1 or 2 digits using the 10-key board. Refer to the SUBAUDIBLE TONE NUMBER CHART on the next page.

4) Push the [ENT] KEY, and then release the [FUNC] SWITCH.

- The FUNCTION DISPLAY returns to the current channel number displayed.

5) To clear the subaudible tone decoder, hold the [FUNC] SWITCH down and push the [2], [CLR] and [ENT] KEYS.

SUBAUDIBLE TONE NUMBER CHART

TONE NUMBER	FREQUENCY (Hz)	TONE NUMBER	FREQUENCY (Hz)	TONE NUMBER	FREQUENCY (Hz)
1	67.0	14	110.9	27	173.8
2	71.9	15	114.8	28	179.9
3	74.4	16	118.8	29	186.2
4	77.0	17	123.0	30	192.8
5	79.7	18	127.3	31	203.5
6	82.5	19	131.8	32	210.7
7	85.4	20	136.5	33	218.1
8	88.5	21	141.3	34	225.7
9	91.5	22	146.2	35	233.6
10	94.8	23	151.4	36	241.8
11	100.0	24	156.7	37	250.3
12	103.5	25	162.2	---	-----
13	107.2	26	167.9	---	-----

3 - 6 OPERATING THE 2-TONE OR 2805Hz DECODER

FUNC **2** **9** **9**

To operate the UT-26 (IC-V100 or IC-U400) or UT-32 (IC-U200) 2-TONE DECODER UNIT, or the UT-27 or UT-33 2805Hz TONE DECODER UNIT, follow the same procedure as outlined in SECTION 3 - 4 SETTING THE SUBAUDIBLE TONE DECODER.

In place of a tone number, the entered number **should be "99"**.

Refer to UT-26/UT-27 or UT-32/UT-33 INSTRUCTIONS for information on how to program the 2805Hz tone number or 2-Tone decoder frequency.

- The subaudible tone encoder (transmit tone) can be used even when the optional decoder unit is installed.

3-7 SETTING THE OFFSET FREQUENCY

FUNC

4

The transceivers can function in either simplex or semi-duplex mode and can be programmed for each channel.

1) Place the transceiver in DIRECT PROGRAMMING MODE. See SECTION 2.

2) Push and hold the [FUNC] SWITCH, and then push the [4] KEY.

- The currently programmed offset frequency appears, or "00.00" if no offset frequency has been programmed.

3) Still holding the [FUNC] SWITCH down, push the [▲] or [▼] KEY to select either +DUPLEX or -DUPLEX.

- The offset frequency disappears from the FUNCTION DISPLAY, and then "+" or "-" appears on the left side of display.

4) Still holding the [FUNC] SWITCH down, enter the desired offset frequency with five digits using the 10-key board.

- If an offset frequency which is not allowed is keyed in, the display reverts back to the previously programmed offset frequency.

5) Push the [ENT] KEY, then release the [FUNC] SWITCH.

- The FUNCTION DISPLAY returns to the current channel number displayed.

6) To clear the offset frequency, hold down the [FUNC] SWITCH down and push the [4], [CLR] and [ENT] KEYS.

3-8 TURNING THE TIME-OUT TIMER ON AND OFF

FUNC

8

The time-out timer function provides automatic stopping of transmitting after 60 seconds when the [PTT] SWITCH is pushed continuously from the beginning of a transmission.

Once the time-out timer function is set, the function is varied for all channels.

1) Place the transceiver in DIRECT PROGRAMMING MODE. See SECTION 2.

2) Push and hold the [FUNC] SWITCH, and then push the [8] KEY to turn the time-out timer function ON and OFF alternately.

- "▼" appears on the FUNCTION DISPLAY when the time-out timer function is turned ON.

3-9 TURNING THE TRANSMIT INHIBIT FUNCTION ON AND OFF

This function allows you to make receive-only channels.

FUNC **9**

- 1) Place the transceiver in DIRECT PROGRAMMING MODE. See SECTION 2.
- 2) Push and hold the [FUNC] SWITCH, and then push the [9] KEY to turn the transmit inhibit function ON and OFF alternately.

3-10 SELECTING THE PRIORITY OR STEP SCAN

IC-H16/IC-U16:

FUNC **SCAN**

IC-V100/IC-U400:

FUNC **LOCK**

The IC-H16, IC-U16, IC-V100 and IC-U400 provide either PRIORITY SCAN or STEP SCAN capability.

PRIORITY SCAN:

The priority channel feature allows easy monitoring of your most important channel while still listening for signals on the programmed channels.

- The transceiver returns to the priority channel if you transmit on the non-priority channel while PRIORITY SCAN is activated.

STEP SCAN:

Repeatedly scans the all programmed channels in sequence. The scan will stop on a channel when a signal is received.

- The transceiver can transmit on any channel even when STEP SCAN is activated.

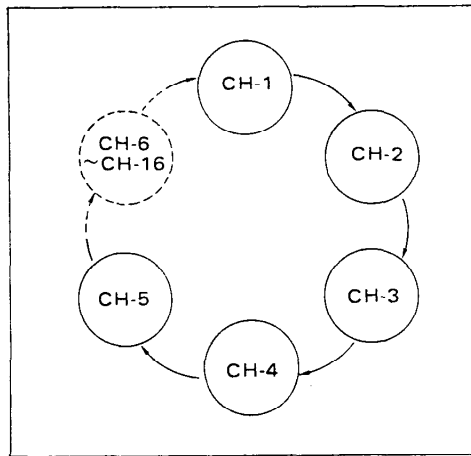
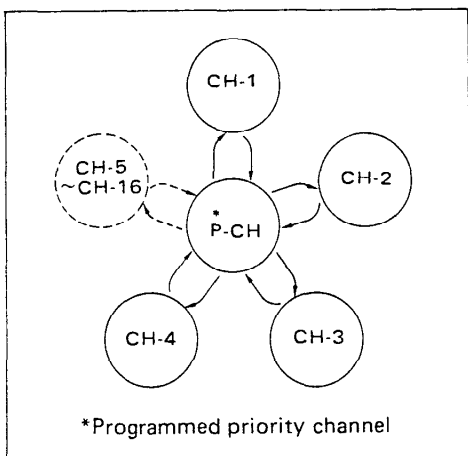
- 1) Place the transceiver in DIRECT PROGRAMMING MODE. See SECTION 2.

- 2) Push and hold the [FUNC] SWITCH, and then push the [SCAN] KEY (IC-H16, IC-U16) or [LOCK] KEY (IC-V100, IC-U400) to set the scan mode, PRIORITY SCAN or STEP SCAN alternately.

- A priority channel number appears or disappears on the FUNCTION DISPLAY.

Small number appears : PRIORITY SCAN
 No small number appear : STEP SCAN

*Tone button up
for scanning*



SECTION 4 CLONING MODE

The IC-U2, IC-V200, IC-U200 and IC-V201 cannot be used as MASTER transceivers.

NOTE: When cloning the parameters to the IC-U2 or IC-U200, the required parameters must first be programmed in channels 1 and 2 of the MASTER IC-U16.

- 1) Turn ON MASTER.
 - 2) Place MASTER in DIRECT PROGRAMMING MODE.
 - 3) Connect PLUG A to MASTER.
 - 4) Connect PLUG B to SLAVE.
 - 5) Set SLAVE in cloning mode.
- 1) Turn ON power to the MASTER transceiver.
 - 2) Place the MASTER transceiver in DIRECT PROGRAMMING MODE. See SECTION 2.
 - 3) Connect PLUG A of the cloning cable to the EXTERNAL MICROPHONE JACK or MIC CONNECTOR of the MASTER transceiver.
 - 4) Connect PLUG B of the cloning cable to the EXTERNAL MICROPHONE JACK or MIC CONNECTOR of the SLAVE transceiver.
 - 5) Set the SLAVE transceiver in cloning mode. Observe the following:
 - IC-H16, IC-U16, IC-U2:**
Push and hold the [FUNC] SWITCH, and turn ON the SLAVE transceiver. Hold the [FUNC] SWITCH until a BEEP tone is emitted from the speaker.
 - IC-V100, IC-U400:**
Push and hold the [SQL] SWITCH, and then turn ON the SLAVE transceiver. Hold the [SQL] SWITCH until a BEEP tone is emitted from the speaker.
 - IC-V200, IC-U200:**
Push and hold the internal switch which is located under the plastic screw on the bottom cover, and then turn ON the transceiver. Hold down the internal switch until the BEEP tone is emitted from the speaker.
 - IC-V201:**
Push and hold the internal switch (S401) on the LOGIC UNIT which is located under the bottom cover, and then turn ON the IC-V201. Hold down the internal switch until the BEEP tone is emitted from the speaker.
- 6) Data transfer from MASTER.
 - 7) Wait for 5 seconds.
- 6) Push and hold the [FUNC] SWITCH, and then push the [BEEP] KEY (IC-H16, IC-U16) or the [COPY] KEY (IC-V100, IC-U400), of the MASTER transceiver, then release the [FUNC] SWITCH.
 - 7) Wait for approximately 5 seconds until the channel number of both the MASTER and SLAVE transceiver appear on the FUNCTION DISPLAY. The cloning procedure is finished now.

FUNC

Power ON

SQL

Power ON

INTERNAL SWITCH

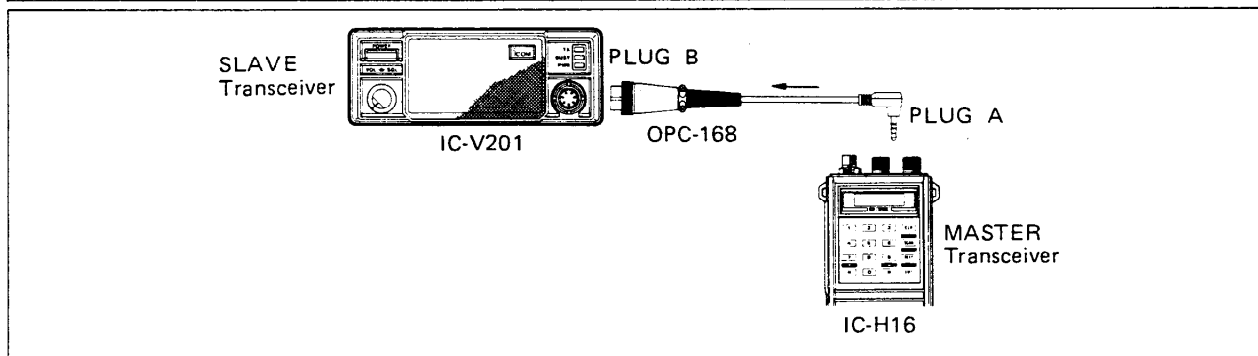
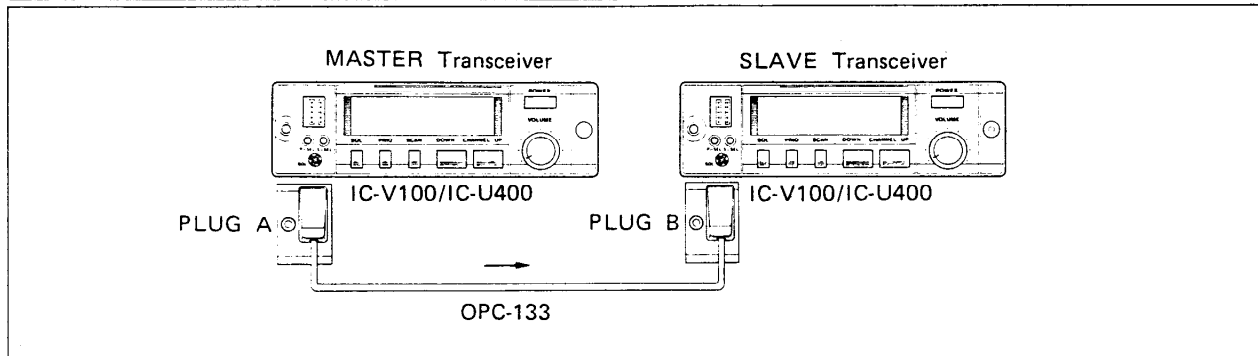
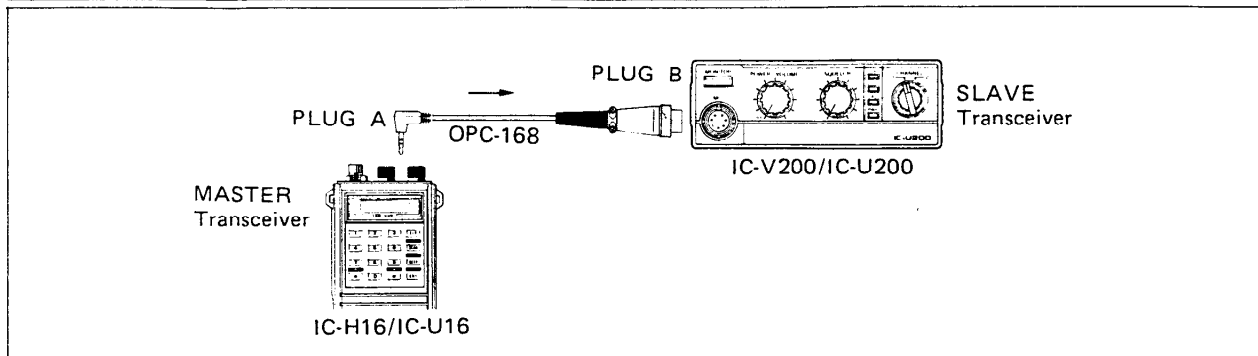
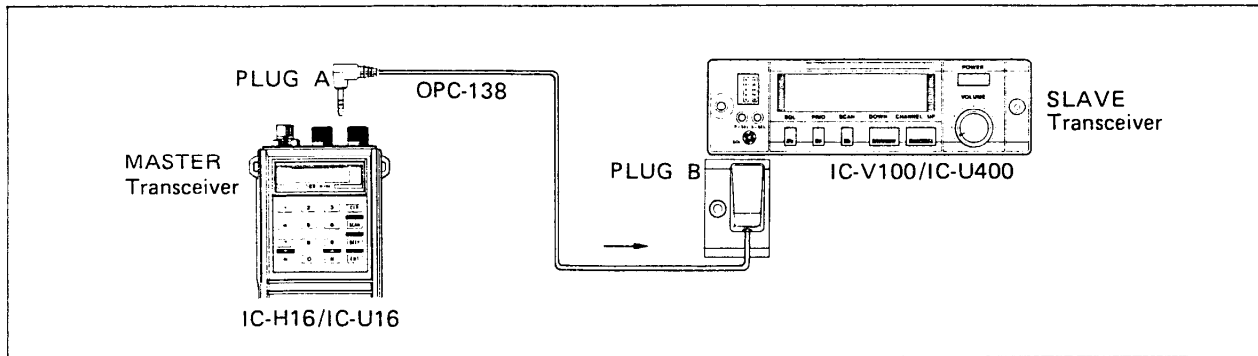
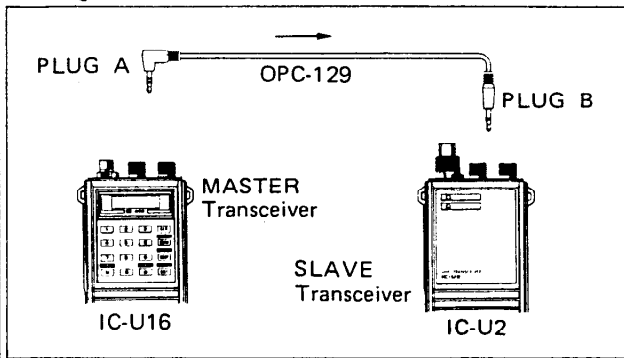
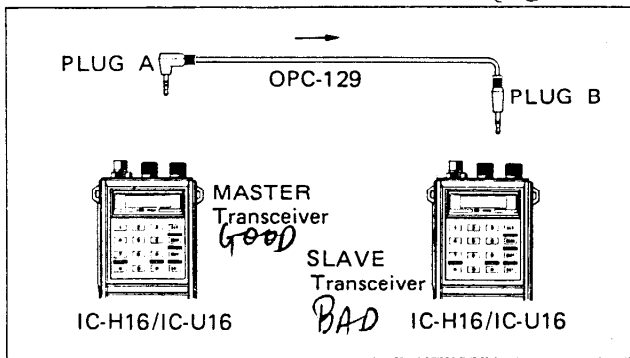
Power ON

INTERNAL SWITCH

Power ON

CLONING CONNECTION

Sleeve to Sleeve



SECTION 5 PROGRAMMING EXAMPLES

This section shows how to program each parameters in DIRECT SETTING MODE.

(1) DIRECT PROGRAMMING MODE (p. 2)

IC-H16/IC-U16 : Unplug P1 on the LOGIC UNIT.
 IC-V100/IC-U400 : Connect the EXTERNAL KEYBOARD.

	(Push and hold)				(Release)
Push keys	FUNC 1 5	9 3	5 7		FUNC
DISPLAY	ch: 1	ch: 1	ch: 1	ch: 1	
	OPERATING MODE			PROGRAMMING MODE	

Turning the power OFF and ON returns the transceiver to OPERATING MODE.

(2) PROGRAMMING CHANNEL (p. 4)

Setting programming channel 16.

Push keys		1	6	ENT
DISPLAY	ch: 1	1	16	ch: 16

(3) OPERATING FREQUENCY (p. 4)

Setting the operating frequency at 163.00MHz.

	(Push and hold)				(Release)
Push Keys	FUNC 5	1 6 3	0 0 0	ENT	FUNC
DISPLAY	ch: 16	00.00	163	163.00	ch: 16

(4) SPECIAL CHANNEL (p. 5)

Setting special channel 99 using channel 16.

	(Push and hold)			(Release)
Push keys	FUNC 7	9 9	ENT	FUNC
DISPLAY	ch: 16 TONE	sch: 0	sch: 99	ch: 99 TONE

(5) SUBAUDIBLE TONE ENCODER (p. 6)

Setting subaudible tone encoder number 8.

	(Push and hold)		(Release)
Push keys	FUNC 1	8	ENT
DISPLAY	ch: 16	: 0	ch: 16

(6) SUBAUDIBLE TONE DECODER (p. 6)

Setting subaudible tone decoder number 37.

	(Push and hold)			(Release)
Push keys	[FUNC] [2]	[3] [7]	[ENT]	[FUNC]
DISPLAY	ch: 15	: 0	: 37	ch: 15 TONE

When programming the IC-V100 or IC-U400, "TONE" dose not appear.

(7) OFFSET FREQUENCY (p. 8)

Setting the offset frequency at -600kHz.

	(Push and hold)			(Release)
Push keys	[FUNC] [4]	[▼]	[0] [0]	[6] [0]
DISPLAY	ch: 15 TONE	00:00	. 00	. 00 60
Push keys	[0]	[ENT]	[FUNC]	
DISPLAY	. 00 60	ch: 15 TONE	ch: 15 TONE	

(8) TRANSMIT INHIBIT (p. 9)

Turning the transmit inhibit function ON and OFF.

	(Push and hold)	(Release)	(Push and hold)	(Release)
Push keys	[FUNC] [9]	[FUNC]	[FUNC] [9]	[FUNC]
DISPLAY	ch: 15 TONE	ch: 15 TONE	ch: 15 TONE	ch: 15 TONE
		Transmit inhibit ON		Transmit inhibit OFF

The FUNCTION DISPLAY dose not show transmit inhibit ON/OFF status.

(9) TIME-OUT TIMER (p. 8)

Turning the time-out timer ON and OFF.

	(Push and hold)	(Release)	(Push and hold)	(Release)
Push keys	[FUNC] [8]	[FUNC]	[FUNC] [8]	[FUNC]
DISPLAY	ch: 15 TONE	ch: 15 TONE	ch: 15 TONE	ch: 15 TONE
		Time-out timer ON		Time-out timer OFF

(10) PRIORITY SCAN OR STEP SCAN (p. 9)

Selecting PRIORITY SCAN or STEP SCAN.

	(Push and hold) *	(Release)	(Push and hold) *	(Release)
Push keys	[FUNC] [SCAN]	[FUNC]	[FUNC] [SCAN]	[FUNC]
DISPLAY	ch: 99 TONE	ch: 99 TONE	ch: 99 TONE	ch: 99 TONE
	PRIORITY SCAN	STEP SCAN		PRIORITY SCAN

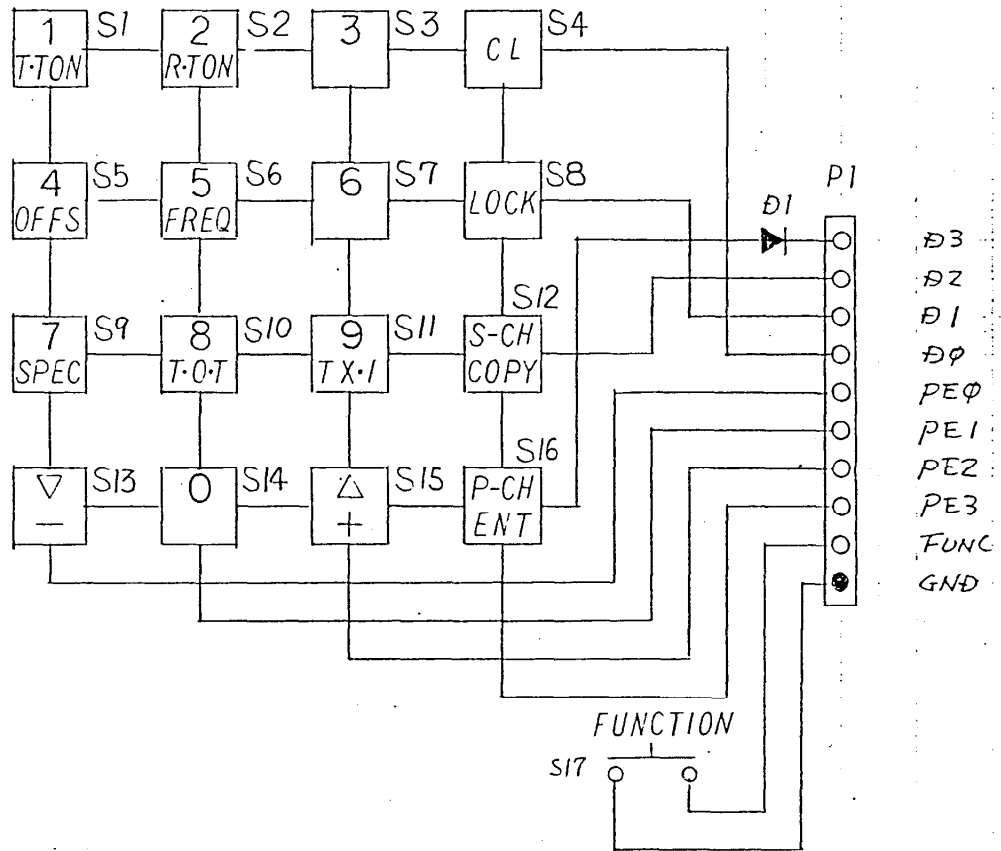
*When programming the IC-V100 or IC-U400, the [LOCK] KEY is used instead of the [SCAN] KEY.

-NOTES-

EX-494 SCHEMATIC

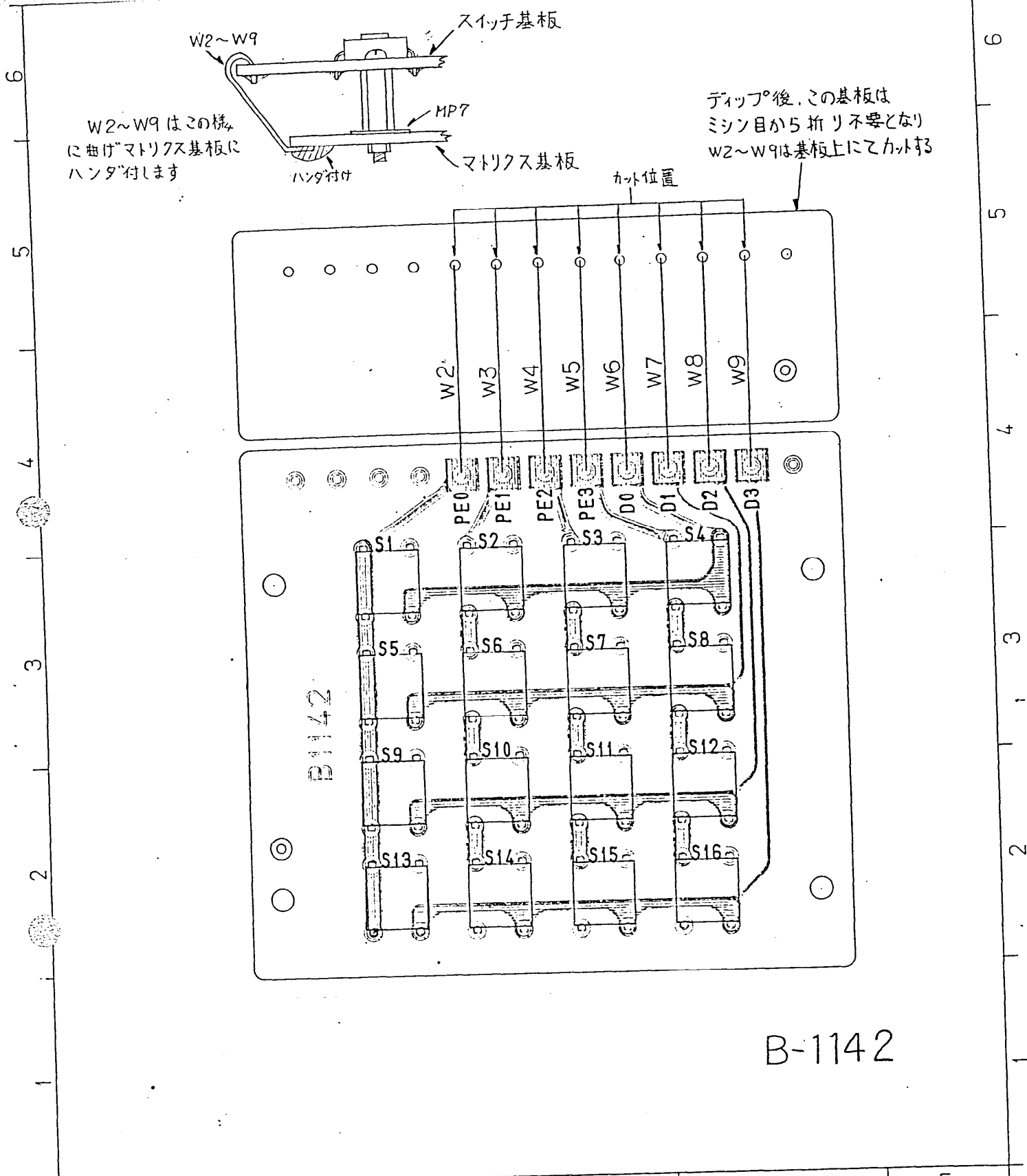
6
5
4
3
2
1

6
5
4
3
2
1



MASTER
Do Not Remove
From Tech Support Area

	A	B	C	D	E
IONS	1	..		DATE 1985 . 7 . 30	MODEL Ex - 494
	2	..		Key Board	
	3	..		Schematic Diagram	DWN.NO. Ex-494-4A1
	4	..		APP. CLKD	DWN.DV.



B-1142

	A	B	C	D	E
ONS	1		DATE 1985. 9. 25	MODEL EX-494	
	2		キーユニット スイッチ基板		
	3		部品配置図	DWN.No.EX-494-8B1-1	
	4				

Pin 7 Gnd 2

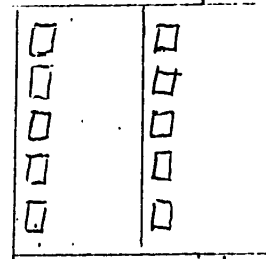
Pin 10 Not

V100-U400 Mic Connection

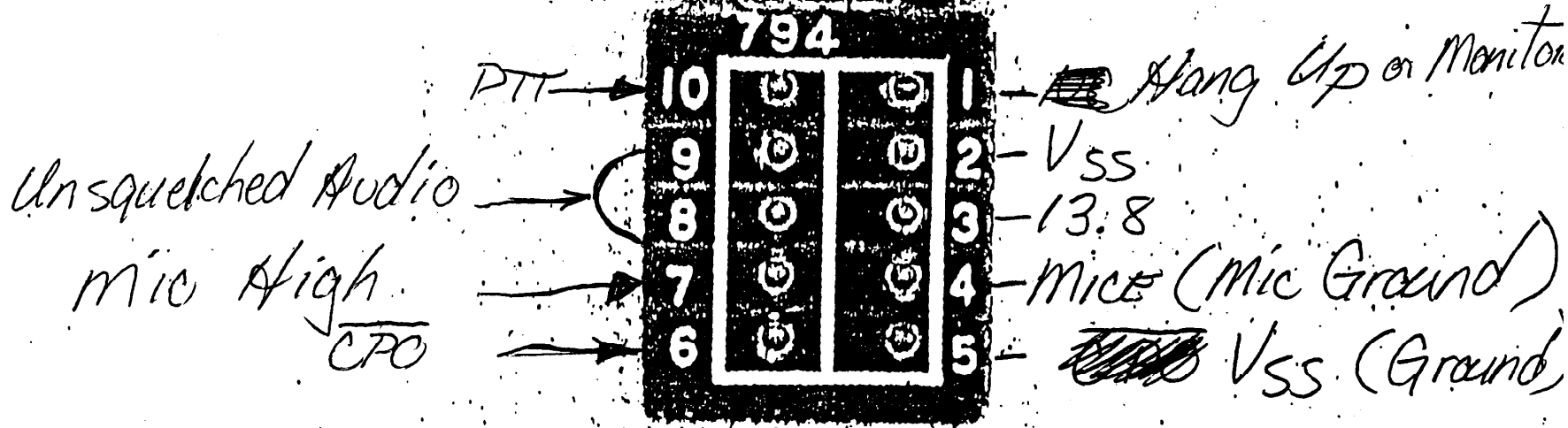
Cloning Cable

PT

Plastic Connectors that will be soldered just this way



MASTER
Do Not Remove
From Tech Support Area





ICOM

SERVICE BULLETIN

MODEL: IC-U400 IC-U16
IC-V100 IC-H16 SN AFFECTED: See Below BULLETIN # 16 March 87-001

DIVISION: AMATEUR _____ MARINE _____ LAND MOBILE AVIONICS _____

SUBJECT: New CPU Programming Instructions

Unit and Serial Number for New CPU

IC-U400 from 3601

IC-V100 from 4101

IC-U16 from 8501

IC-H16 from 8401

CPU Change U400, V100, H16, U16

New CPU Features:

1. Priority or Regular Scan

To disable Priority Scan feature:

- a. Enter Programming Mode
- b. Depress Function button, then depress Scan button.
- c. Decimal point will blink while in non-priority scan.

To enable Priority Scan:

- a. Repeat above procedure.

2. Time-Out Timer Indicator:

If Time-Out Timer is programmer, then a ▼ will appear.

Only indicated in Program Mode.

3. H16/U16 only:

- a. Radio will indicate all channels to be scanned; i.e., U400/V100.
- b. Radio will not blink while in Sleep Mode.
- c. Radio will transmit while in the Sleep Mode.
- d. Radio will enter Sleep Mode after one minute of no activity.
- e. Keyboard inhibit diode replaced with jumper plug.

Opc 138

Looking at Front of
Radio
V100/U400
mic jack

Not Used - Tip

