



**CT-17**

COMMUNICATION INTERFACE-V (CI-V)  
LEVEL CONVERTOR

INSTRUCTION MANUAL



## FOREWORD

Thank you for purchasing the **CT-17** COMMUNICATION INTERFACE-V (CI-V) LEVEL CONVERTER from ICOM.

Using the **CT-17**, ICOM CI-V radios can be externally controlled with a personal computer equipped with an EIA standard RS-232C I/O port.

Up to 4 ICOM CI-V radios can be used for frequency, mode, and memory channel control with your program.

A sample program is described below on page 22. Enjoy creating your own programs with the **CT-17**.

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## UNPACKING

Accessories	Qty.
① Mini-plug cables (OPC-017A) . . . . .	2
② Power supply cable (OPC-012) . . . . .	1
③ RS-232C cable (OPC-159) . . . . .	1

# 1. CONNECTIONS

**CAUTION:** Power to the radios and your personal computer must remain OFF before connecting each unit.

(1) Set the same baud rate for your computer and radio. Refer to your computer instruction manual.

- The radio is set at the standard ICOM CI-V baud rate of 1200bps.

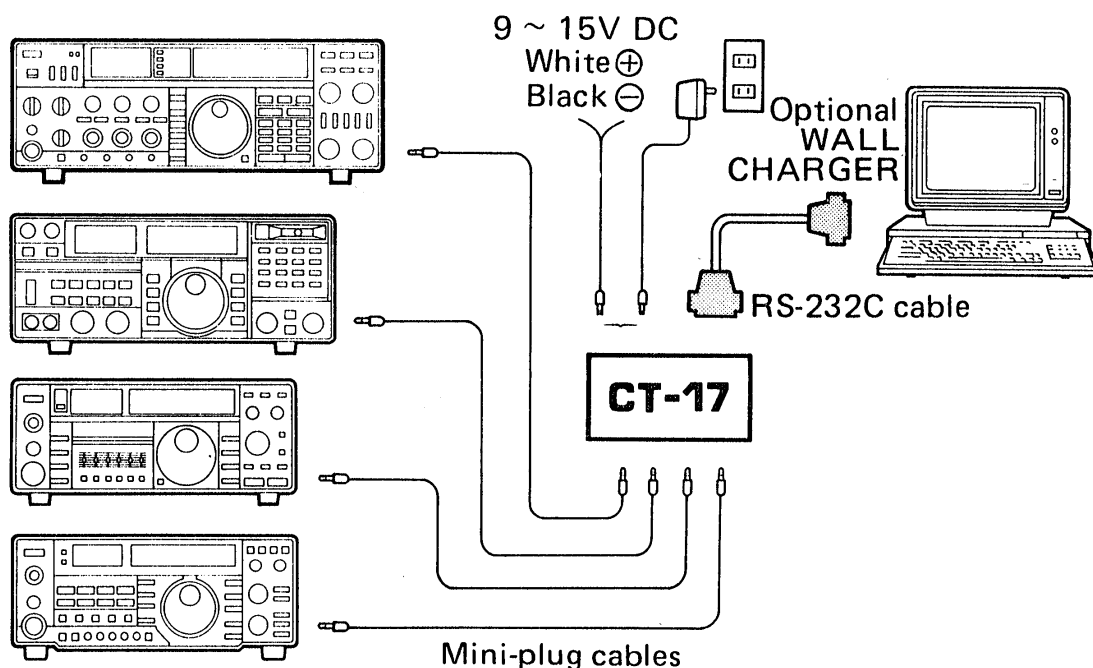
(2) Connect the supplied mini-plug cable and RS-232C cable.

- The inch-type screws are used on the supplied RS-232C cable. If the RS-232C terminal of your computer uses meter-type screws, the supplied meter-type screws must be used to connect the cable.

(3) Connect the power source to the 9-15V DC IN JACK using the supplied DC cable. The optional BC-25U, BC-25E, BC-26E or BC-27 WALL CHARGER can also be used.

(4) Turn power to the radios and your personal computer ON.

**NOTE:** If the radio is set near a computer, it may receive computer noise.



## 2. GENERAL FUNCTIONS

### ■ ADDRESS NUMBER

Address numbers of the radios are fixed with the ADDRESS SWITCH or ADDRESS CONNECTOR inside the radios. The ICOM standard address numbers are as follows:

MODEL	ADDRESS NUMBER	MODEL	ADDRESS NUMBER	MODEL	ADDRESS NUMBER
IC-761	1EH (30)	IC-735	04H ( 4)	*IC-471A/E/H	22H (34)
IC-275A/E/H	10H (16)	IC-R7000	08H ( 8)	*IC-1271A/E	24H (36)
IC-475A/E/H	14H (20)	*IC-751A	1CH (28)	*IC-R71A/E/D	1AH (26)
IC-375A	12H (18)	*IC-751	1CH (28)		
IC-575A/E/H	16H (22)	*IC-271A/E/H	20H (32)		

\* Address numbers are fixed by the UX-14.

Bracketed figures ( ) are decimals and figures marked with an H are hexadecimal.

### ■ FUNCTION

Each radio can be controlled by your computer as described on p. 3.

## MODEL FUNCTION LIST

FUNCTION	CONTROL COMMAND	PROGRAM No. (p. 4 ~ 9)	IC-761	IC-275A/E/H IC-375A IC-475A/E/H IC-575A/E/H	IC-735	IC-R7000	IC-751A IC-751 IC-R71A/E/D	IC-271A/E/H IC-471A/E/H IC-1271A/E
FREQ. SET (transceive mode)	00*	2	Yes	Yes	Yes	Yes	Yes	Yes
MODE SET (transceive mode)	01*	1	Yes	Yes	Yes	Yes	Yes	Yes
BAND EDGE READ	02	4	Yes	Yes	Yes	Yes	Yes	Yes
FREQ. READ	03	4	Yes	Yes	Yes	Yes	Yes	Yes
MODE READ	04	4	Yes	Yes	Yes	Yes	Yes	Yes
FREQ. SET	05	2	Yes	Yes	Yes	Yes	Yes	Yes
MODE SET	06	1	Yes	Yes	Yes	Yes	Yes	Yes
VFO SET	07	1	NOTE	Yes	Yes	No	NOTE	NOTE
MEMORY CH. SET	08	3	Yes	Yes	Yes	Yes	Yes	Yes
MEMORY WRITE	09	3	Yes	Yes	Yes	Yes	Yes	Yes
MEMORY VFO	0A	3	Yes	Yes	Yes	No	Yes	Yes
MEMORY CLEAR	0B	3	No	Yes	No	Yes	No	No
OFFSET READ	0C	4	No	Yes	No	No	No	Yes
OFFSET WRITE	0D	2	No	Yes	No	No	No	Yes
SCAN START/STOP	0E	3	No	Yes	No	No	No	No

NOTE: VFO A and B do not change. Only VFO mode is selected.

\* CONTROL COMMAND 00 and 01 ignore each radio's address switch position when the radio address in the program is replaced with 00H.

### 3. BASIC PROGRAMS

This section explains how to use each control command. Please study the section carefully to thoroughly understand the capabilities of the CI-V System and create your own program using these basic programs.

#### ■ PROGRAM 1 (MODE AND VFO SETTING)

```

10 REM          ICOM CI-V Packet Diagram
20 REM -----
30 REM | PR$ | RE$ | TX$ | CN$ | D A $ | FI$ |
40 REM -----
50 REM
60 PR$=CHR$(&HFE)+CHR$(&HFE)      ' PREAMBLE
70 RE$=CHR$(&H10)                  ' TRANSCEIVER ADDRESS (IC-275)
80 TX$=CHR$(&HE0)                  ' CONTROLLER ADDRESS
90 FI$=CHR$(&HFD)                  ' END OF MESSAGE
100 DEFINT G-Z :CLS
110 OPEN "COM:N81NN" AS #1
120 MD$=" LSB USB A M C W RTTY F M VFO AVFO BE N D"
130 FOR G=1 TO 9 :I=(G-1)*5+1:KEY G,(MID$(MD$,I,5))
140 NEXT G :KEY 10,"M->VFO"
150 ON KEY GOSUB *A,*B,*C,*D,*E,*F,*G,*H,*I,*J
160 KEY ON
170 LOCATE 25,10 :PRINT "f.1 - f.2 KEY ON " :GOTO 170
180 *A :CN$=CHR$(6):DA$=CHR$(0):GOSUB *DATAOUT:RETURN
190 *B :CN$=CHR$(6):DA$=CHR$(1):GOSUB *DATAOUT:RETURN
200 *C :CN$=CHR$(6):DA$=CHR$(2):GOSUB *DATAOUT:RETURN
210 *D :CN$=CHR$(6):DA$=CHR$(3):GOSUB *DATAOUT:RETURN
220 *E :CN$=CHR$(6):DA$=CHR$(4):GOSUB *DATAOUT:RETURN
230 *F :CN$=CHR$(6):DA$=CHR$(5):GOSUB *DATAOUT:RETURN
240 *G :CN$=CHR$(7):DA$=CHR$(0):GOSUB *DATAOUT:RETURN
250 *H :CN$=CHR$(7):DA$=CHR$(1):GOSUB *DATAOUT:RETURN
260 *J :CN$=CHR$(7):DA$="" :GOSUB *DATAOUT:RETURN
270 *I :KEY OFF :CLOSE :END
1000 *DATAOUT
1010 INS$=PR$+RE$+TX$+CN$+DA$+FI$
1020 PRINT #1,INS$;
1030 RETURN

```

CONTENTS	LINE NUMBER	SAMPLE
Radio address	70	(&H10): IC-275A/E/H (See p. 2)

## PROGRAM 2 (FREQ. OR OFFSET SETTING)

```

10 REM          ICOM CI-V Packet Diagram
20 REM -----
30 REM | PR$ | RE$ | TX$ | CN$ | D A $ | FI$ |
40 REM -----
50 REM
60 PR$=CHR$(&HFE)+CHR$(&HFE)      ' PREAMBLE
70 RE$=CHR$(&H10)                  ' TRANSCEIVER ADDRESS (IC-275)
80 TX$=CHR$(&HE0)                  ' CONTROLLER ADDRESS
90 FI$=CHR$(&HFD)                  ' END OF MESSAGE
100 CN$=CHR$(&H5)                  ' FREQUENCY SET COMMAND
110 DA$=""                          ' FREQUENCY DATA
120 DEFINT G-Z :DEFDBL F :DIM CH$(110)
130 FOR M=0 TO 9
140   FOR N=0 TO 9
150     CH$(10*M+N)=CHR$(16*M+N)
160   NEXT N
170 NEXT M
500 OPEN "COM:N81NN" AS #1
510 REM ***** S E T FREQUENCY *****
520 CLS:LOCATE 20,5: INPUT "FREQUENCY INPUT (MHz)";F
530 F=F+1E-12:IF F<.1 THEN 520
540 F$=RIGHT$("00000"+MID$(STR$(INT(F*1000000#)),2),10)
550 FOR K=1 TO 10 STEP 2
560 DA$=CH$(VAL(MID$(F$,K,2)))+DA$
570 NEXT K
580 GOSUB *DATAOUT :CLOSE :END
1000 *DATAOUT
1010 INS$=PR$+RE$+TX$+CN$+DA$+FI$
1020 PRINT #1,INS$;
1030 RETURN

```

CONTENTS	LINE NUMBER	SAMPLE
Radio address	70	(&H10): IC-275A/E/H (See p. 2)
Control command	100	(&H5) : FREQ. SET Change to (&D) for offset. (See p. 3)
For offset frequency	540	(F*1000000#), 2), 10) → (F*10000#), 2), 6)
	550	TO 10 → TO 6
For IC-735	540	(F*1000000#), 2), 10) → (F*1000000), 2), 8)
	550	TO 10 → TO 8

## PROGRAM 3 (MEMORY AND SCAN OPERATION)

```

10 REM          ICOM CI-V Packet Diagram
20 REM -----
30 REM | PR$ | RE$ | TX$ | CN$ | D A $ | FI$ |
40 REM -----
50 REM
60 PR$=CHR$(&HFE)+CHR$(&HFE)      ' PREAMBLE
70 RE$=CHR$(&H10)                 ' TRANSCEIVER ADDRESS (IC-275)
80 TX$=CHR$(&HE0)                 ' CONTROLLER ADDRESS
90 FI$=CHR$(&HFD)                 ' END OF MESSAGE
100 DEFINT G-Z :DIM CH$(110) :CLS
110 FOR M=0 TO 9
120   FOR N=0 TO 9
130     CH$(10*M+N)=CHR$(16*M+N)
140   NEXT N
150 NEXT M
160 OPEN "COM:N81NN" AS #1
170 *MAIN
180 LOCATE 10,5 :PRINT "1 ..... SET MEMORY (VFO --> MEMORY)"
190 LOCATE 10,6 :PRINT "2 ..... SET MEMORY CH "
200 LOCATE 10,7 :PRINT "3 ..... MEMORY WRITE"
210 LOCATE 10,8 :PRINT "4 ..... MEMORY --> VFO WRITE"
220 LOCATE 10,9 :PRINT "5 ..... MEMORY CLEAR"
230 LOCATE 10,10:PRINT "6 ..... SCAN START"
240 LOCATE 10,11:PRINT "7 ..... SCAN STOP"
250 LOCATE 10,12:PRINT "8 ..... E N D"
260 LOCATE 35,14:PRINT "          "
270 LOCATE 10,14:INPUT "          INPUT COMMAND NO. ";I
280 IF I<0 OR I>9 THEN 260
290 IF I=1 THEN CN$=CHR$(8) :DA$="" :GOSUB *DATAOUT :GOTO *MAIN
300 IF I=2 THEN LOCATE 10,16:INPUT "MEMORY CH";I :CN$=CHR$(8)
:DA$=CH$(I) :GOSUB *DATAOUT :LOCATE 10,16
:PRINT "          ":GOTO *MAIN
310 IF I=3 THEN CN$=CHR$(&H9):DA$="" :GOSUB *DATAOUT :GOTO *MAIN
320 IF I=4 THEN CN$=CHR$(&HA):DA$="" :GOSUB *DATAOUT :GOTO *MAIN
330 IF I=5 THEN CN$=CHR$(&HB):DA$="" :GOSUB *DATAOUT :GOTO *MAIN
340 IF I=6 THEN CN$=CHR$(&HE):DA$=CHR$(1):GOSUB *DATAOUT:GOTO *MAIN
350 IF I=7 THEN CN$=CHR$(&HE):DA$=CHR$(0):GOSUB *DATAOUT:GOTO *MAIN
360 IF I=8 THEN CLOSE :END
370 GOTO *MAIN
1000 *DATAOUT
1010 INS$=PR$+RE$+TX$+CN$+DA$+FI$
1020 PRINT #1,INS$;
1030 RETURN

```

CONTENTS	LINE NUMBER	SAMPLE
Radio address	70	(&H10): IC-275A/E/H (See p. 2)



# PROGRAM 4 (PARAMETER READING)

```

10 REM          ICOM CI-V Packet Diagram
20 REM -----
30 REM | PR$ | RE$ | TX$ | CN$ | D A $ | FI$ |
40 REM -----
50 REM
60 PR$=CHR$(&HFE)+CHR$(&HFE)      ' PREAMBLE
70 RE$=CHR$(&H10)                  ' TRANSCEIVER ADDRESS (IC-275)
80 TX$=CHR$(&HE0)                  ' CONTROLLER ADDRESS
90 FI$=CHR$(&HFD)                  ' END OF MESSAGE
100 CN$=CHR$(&H2)                  ' U/L FREQUENCY READ COMMAND
110 DA$=""                          ' FREQUENCY DATA
120 DEFINT A-Z :CLS
130 OPEN "COM:N81NN" AS #1
150 MA$=" LSB USB A M C W RTTY F M "
1000 *DATAOUT
1010 INS$=PR$+RE$+TX$+CN$+DA$+FI$
1020 PRINT #1,INS$;
1030 *DATAIN :D$="":Z=0
1040 IF LOC(1)=0 THEN 1040
1050 I$=INPUT$(LOC(1),#1) :L=LEN(I$)
1060 FOR K=1 TO L
1070 P$=MID$(I$,K,1) :M=ASC(P$)
1080 IF P$=CHR$(&HFC) THEN DI$="" :GOTO 1120
1090 IF M<16 THEN X$="0"+HEX$(M) ELSE X$=HEX$(M)
1100 IF M=&HFD THEN DI$=D$ :GOSUB 1500
1110 D$=X$+D$
1120 NEXT K
1130 IF Z>1 THEN 2000
1140 GOTO 1040
1150 IF LEFT$(DI$,8)="FA10E0FE" THEN PRINT " N G ":CLOSE:END
1160 IF LEFT$(DI$,8)="FB10E0FE" THEN PRINT " O K ":CLOSE:END
1170 D$="" :X$=""
1180 RETURN
1500 X=INSTR (DI$,"0210E0FE") :IF X<>0 THEN Z=2
1510 X=INSTR (DI$,"0310E0FE") :IF X<>0 THEN Z=3
1520 X=INSTR (DI$,"0410E0FE") :IF X<>0 THEN Z=4
1530 X=INSTR (DI$,"0C10E0FE") :IF X<>0 THEN Z=5
1540 D$="" :X$=""
1545 PRINT DI$,Z
1550 RETURN
2000 ON (Z-1) GOTO *UPLO,*FRQU,*MODE,*OSET
2010 *UPLO
2020 FH$=LEFT$(DI$,10):FL$=MID$(DI$,13,10)
2030 PRINT VAL(FH$);"Hz -";VAL(FL$);"Hz"
2040 CLOSE :END
2100 *MODE
2120 IF LEN(DI$)=14 THEN 2150
2130 C=VAL(LEFT$(DI$,2))*5+1:IF C>37 THEN MO$="- - - - -" :GOTO 2160
2140 MO$=MID$(MA$,C,5):GOTO 2160
2150 IF LEFT$(DI$,4)="0005" THEN MO$="SSB(R7000)" ELSE MO$=LEFT$(DI$,4)
2160 PRINT MO$ :CLOSE :END
2200 *FRQU
2210 IF LEFT$(DI$,2)="FF" THEN F$="- - - - -" :GOTO 2230
2220 F$=LEFT$(DI$,10) :F#=VAL(F$)/1000000#
2230 PRINT F#;"MHz" :CLOSE :END
2300 *OSET
2310 F$=LEFT$(DI$,6) :F#=VAL(F$)/10000#
2320 PRINT F#;"MHz" :CLOSE :END

```

CONTENTS	LINE NUMBER	SAMPLE
Radio address	70	(&H10): IC-275A/E/H (See p. 2)
	1150, 1160	"FA10E0FE" : IC-275A/E/H (See p. 3)
	1500~1530	"0210E0FE" : IC-275A/E/H (See p. 3)
Control command	100	(&H2) : Band edge reading. (&H3), (&H4) or (&HC) is acceptable. (See p. 3)
For IC-735	2020	(DI\$, 10) → (DI\$, 8) (DI\$, 13, 10) → (DI\$, 11, 8)
	2220	(DI\$, 10) → (DI\$, 8)

**NOTE 1:** Line numbers 1000 ~ 1180 are a confirmation program that can also be used for PROGRAMS 1, 2 and 3 (line number 1000 ~ 1030 on PROGRAMS 1, 2 or 3). This program displays "OK" or "NG" on the computer CRT DISPLAY to check the command operation.

When this program is used, GOSUB 1500 in line number 1100 must be replaced with GOSUB 1150, and control codes 00 and 01 cannot be accepted.

**NOTE 2:** This program does not read Narrow mode (i.e., CW-Narrow, RTTY-Narrow). When the radio is in such a mode the following mode codes appear on the computer CRT DISPLAY.

WIDTH CODE	WIDTH	MODE CODE	MODE	MODE CODE	MODE
01	Wide (Normal)	00	LSB	03	CW
02	Narrow	01	USB	04	RTTY
03	Super-narrow	02	AM	05	FM
i.e. CW-Narrow : 0203					

**NOTE 3:** If the wrong address number is entered in this program, it is possible that an infinite loop is made, so the computer does not answer. In this case, the program should be stopped (i.e. push STOP KEY).

## ●Continuous parameter reading

When making the following modifications for PROGRAM 4 the frequency and mode are shown on the computer CRT DISPLAY each time they change.

1. Erase line numbers 60 ~ 110.
2. Erase line numbers 1000 ~ 1020.
3. Erase line numbers 1100 ~ 2320.
4. Turns ON the transceiver flag switch inside the radio.
5. Inputs the following program.

```

1100 IF M=&HFD THEN DI$=D$ :GOSUB 3000
1110 D$=X$+D$
1120 NEXT K
1140 GOTO 1040
3000 X=INSTR (DI$,"000200FE") :IF X<>0 THEN 3100
3020 X=INSTR (DI$,"010200FE") :IF X<>0 THEN 3200
3040 D$="" :X$=""
3050 RETURN
3100 F$=LEFT$(DI$,10):F#=VAL(F$)/1E+06
3140 PRINT USING "#####.#####MHz";F#
3150 GOTO 3040
3200 IF LEN(DI$)=14 THEN 3230
3210 C=VAL(LEFT$(DI$,2))*5+1 :IF C>37 THEN MO$="-----" :GOTO 3260
3220 MO$=MID$(MA$,C,5):GOTO 3260
3230 IF LEFT$(DI$,4)="0005" THEN MO$="SSB(R7000)"
3235 IF LEFT$(DI$,4)="0205" THEN MO$="FM-N "
3240 IF LEFT$(DI$,4)="0204" THEN MO$="RTTY-N"
3245 IF LEFT$(DI$,4)="0203" THEN MO$=" C W-N"
3260 '
3270 PRINT MO$ :GOTO 3040

```

CONTENTS	LINE NUMBER	SAMPLE
Radio address	3000	(DI\$, "00 <u>0</u> 200FE") : Change to required address number. (See p. 2)
	3020	(DI\$, "01 <u>0</u> 200FE") : Change to required address number. (See p. 2)
For IC-735	3100	(DI\$, 10) → (DI\$, 8)

**NOTE:** When the frequency or mode is changed quickly the computer may not read each parameter.

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## 4. SAMPLE PROGRAM

This sample program is developed for use with the NEC N88-BASIC language for NEC PC-9800 series computer. Make modifications as necessary to suit your personal computer using the program.

### CAUTIONS:

1. Use controller address E0.
2. Do not set address switch inside radio for address numbers 0H and F0H ~ FFH (0 and 240 ~ 255).
3. When a blank status memory channel is selected and appears on the radio display, the memory channel is blank even if the computer shows a previously sent frequency on the computer display. This discrepancy may occur with some radios.
4. This program is made for most radios using 10 byte for frequency reading and setting (including band edge data). The IC-735, however, uses 8 byte, so refer to PROGRAMS 2 and 4 in the BASIC PROGRAMS section when programming for the IC-735.

## SAMPLE PROGRAM

```

10 ' *****
20 ' **          ICOM CI-V          **
30 ' **      CT-17  REMOTE CONTROL  **
40 ' **      86/06/06  Ver. 1.0    **
50 ' **  Copyright(C) by ICOM INC.  **
60 ' *****
70 '
80 '          ICOM CI-V  Packet Diagram
90 ' -----
100 ' |   PR$   | RE$ | TX$ | CN$ |   D   A   $   | FI$ |
110 ' -----
120 '
130 PR$=CHR$(&HFE)+CHR$(&HFE)      ' PREAMBLE
140 RE$=CHR$(&H8)                  ' TRANSCEIVER ADDRESS   :IC-R7000
150 TX$=CHR$(&HE0)                  ' CONTROLLER ADDRESS   :0E0H
160 CN$=""                          ' CONTROL CODE
170 DA$=""                          ' DATA
180 FI$=CHR$(&HFD)                  ' END OF MESSAGE
190 '
200 MDA$="LSB USB A M C W R TTYF M "
210 WIDTH 80,25 :CONSOLE 20,5,0,0
220 DIM CH$(110),FQ$(110),MO$(110),MM$(110),FF$(110)
230 DEFDBL B: DEFINT C-Z
240 CX=0: CY=20: LY1=1: LY2=1: LY3=1: LY4=1: LY5=1
250 B$=""                          ": B1$=""
260 ME$=CHR$(&H1B)+CHR$(&H4B)+CHR$(&H22)+CHR$(&H2A)+CHR$(&H1B)+CHR$(&H41)
270 ON STOP GOSUB 3410
280 STOP ON
290 FOR M=0 TO 9
300   FOR N=0 TO 9
310     CH$(10*M+N)=CHR$(16*M+N)
320   NEXT N
330 NEXT M
340 OPEN "COM:N81NN" AS #1
350 ON COM GOSUB 2730
360 GOSUB 3260
370 LOCATE 6,9 :PRINT "M O D E "
380 LOCATE 6,11 :PRINT "FREQUENCY"
390 '
400 '   MENU ROUTINE
410 '
420 LOCATE 50,1 : PRINT "◆ SET FREQUENCY (TRANSCIEVE) "
430 LOCATE 50,2 : PRINT "◆ SET MODE (TRANSCIEVE) "
440 LOCATE 50,3 : PRINT "◆ READ UPPER/LOWER FREQUENCY "
450 LOCATE 50,4 : PRINT "◆ READ FREQUENCY "
460 LOCATE 50,5 : PRINT "◆ READ MODE "
470 LOCATE 50,6 : PRINT "◆ SET FREQUENCY "
480 LOCATE 50,7 : PRINT "◆ SET MODE "
490 LOCATE 50,8 : PRINT "◆ SET VFO "
500 LOCATE 50,9 : PRINT "◆ SET MEMORY "
510 LOCATE 50,10: PRINT "◆ MEMORY WRITE "
520 LOCATE 50,11: PRINT "◆ VFO WRITE (M-CH -> VFO) "
530 LOCATE 50,12: PRINT "◆ MEMORY CLEAR "
540 LOCATE 50,13: PRINT "◆ READ OFFSET FREQUENCY "
550 LOCATE 50,14: PRINT "◆ SET OFFSET FREQUENCY "
560 LOCATE 50,15: PRINT "◆ SCAN CONTROL"
570 COM ON
580 LOCATE 50,LY2
590 COLOR@(50,LY2)-(50,LY2),6
600 A$=INKEY$
610 IF A$="" THEN GOTO 600
620 N=15: J=50: LY=LY2
630 GOSUB 3050
640 LY2=LY
650 ON K GOTO 600,590,660,600
660 COLOR@(50,LY2)-(50,LY2),0
670 ON LY2 GOTO 770,1270,710,710,710,770,1270,1570,1810,710,710,710 ,710,2290
,2400
680 '
690 '   ANSWER COMMAND
700 '

```

```

710 DA$=""
720 GOSUB 2620
730 GOTO 590
740 '
750 '     FREQUENCY WRITE
760 '
770 COM STOP
780 FQ=1
790 LOCATE 25,4: PRINT "FREQUENCY INPUT (MHz)"
800 LOCATE 29,6: PRINT "■"
810 LOCATE 25,8: PRINT ME$;" key then return to MENU"
820 COLOR@(29,6)-(29,6),6
830 COM ON
840 L=10: M=6
850 A$=INKEY$
860 IF A$="" THEN GOTO 850
870 IF INSTR ("0123456789."+CHR$(13)+CHR$(28),A$)=0 THEN GOTO 850
880 IF A$=CHR$(13) THEN GOTO 1080
890 IF A$=CHR$(28) THEN GOSUB 2960: GOTO 590
900 IF K=1 THEN 1000
910 IF A$="." THEN 970
920 FOR N=1 TO 3
930 MID$(B$,N,1)=MID$(B$,N+1,1)
940 NEXT N
950 MID$(B$,4,1)=A$
960 GOTO 1040
970 MID$(B$,5,1)="."
980 K=1
990 GOTO 1040
1000 IF M=12 THEN GOTO 1040
1010 MID$(B$,M,1)=A$
1020 M=M+1
1030 GOTO 1040
1040 COM STOP
1050 LOCATE 30,6: PRINT B$
1060 COM ON
1070 GOTO 850
1080 MID$(B$,M,6)="000000"
1090 FOR N=L TO 6 STEP -2
1100 B1$=MID$(B$,N,2)
1110 F=VAL(B1$)
1120 DA$=DA$+CH$(F)
1130 NEXT N
1140 FOR N=3 TO 1 STEP -2
1150 B1$=MID$(B$,N,2)
1160 F=VAL(B1$)
1170 DA$=DA$+CH$(F)
1180 IF L=8 THEN GOTO 1200
1190 NEXT N
1200 B$=" "
1210 COLOR@(26,6)-(26,6),0
1220 GOSUB 2620: GOSUB 2960
1230 IF FQ=1 THEN GOTO 770 ELSE 2290
1240 '
1250 '     MODE WRITE
1260 '
1270 COM STOP
1280 LOCATE 25,1 : PRINT "◆ LSB"
1290 LOCATE 25,2 : PRINT "◆ USB"
1300 LOCATE 25,3 : PRINT "◆ AM"
1310 LOCATE 25,4 : PRINT "◆ CW"
1320 LOCATE 25,5 : PRINT "◆ RTTY"
1330 LOCATE 25,6 : PRINT "◆ FM"
1340 LOCATE 25,7 : PRINT "◆ FM-n"
1350 LOCATE 25,8 : PRINT "◆ SSB (IC-R7000 ONLY)"
1360 LOCATE 25,10: PRINT ME$;" key then return to MENU"
1370 COM ON
1380 LOCATE 25,LY1
1390 COLOR@(25,LY1)-(25,LY1),6
1400 A$=INKEY$
1410 IF A$="" THEN GOTO 1400

```

```

1420 N=9: J=25: LY=LY1
1430 GOSUB 3050
1440 LY1=LY
1450 ON K GOTO 1400,1390,1460,1520
1460 COLOR@(25,LY1)-(25,LY1),0
1470 C=LY1-1
1480 ON LY1 GOTO 1500,1500,1500,1500,1500,1500,1510,1490
1490 DA$=CH$(5)+CH$(0):GOSUB 2620: GOTO 1390
1500 DA$=CH$(C):GOSUB 2620: GOTO 1390
1510 DA$=CH$(5)+CH$(2):GOSUB 2620: GOTO 1390
1520 GOSUB 2960
1530 GOTO 590
1540 '
1550 '      VFO CHANGING
1560 '
1570 COM STOP
1580 LOCATE 25,1 : PRINT "◆ VFO A"
1590 LOCATE 25,2 : PRINT "◆ VFO B"
1600 LOCATE 25,3 : PRINT "◆ M-CH MODE -> VFO MODE"
1610 LOCATE 25,5 : PRINT ME$;" key then return to MENU"
1620 COM ON
1630 LOCATE 25,LY3
1640 COLOR@(25,LY3)-(25,LY3),6
1650 A$=INKEY$
1660 IF A$="" THEN GOTO 1650
1670 N=3: J=25: LY=LY3
1680 GOSUB 3050
1690 LY3=LY
1700 ON K GOTO 1650,1640,1710,1760
1710 COLOR@(25,LY3)-(25,LY3),0
1720 C=LY3-1
1730 ON LY3 GOTO 1740,1740,1750
1740 DA$=CH$(C): GOSUB 2620: GOTO 1640
1750 DA$="": GOSUB 2620: GOTO 1640
1760 GOSUB 2960
1770 GOTO 590
1780 '
1790 '      MEMORY CALL
1800 '
1810 COM STOP
1820 LOCATE 25,1 : PRINT "◆ VFO MODE -> M-CH MODE"
1830 LOCATE 25,2 : PRINT "◆ CH INPUT"
1840 LOCATE 25,8 : PRINT ME$;" key then return to MENU"
1850 COM ON
1860 LOCATE 25,LY4
1870 COLOR@(25,LY4)-(25,LY4),6
1880 A$=INKEY$
1890 IF A$="" THEN GOTO 1880
1900 N=2: J=25: LY=LY4
1910 GOSUB 3050
1920 LY4=LY
1930 ON K GOTO 1880,1870,1940,1970
1940 COLOR@(25,LY4)-(25,LY4),0
1950 ON LY4 GOTO 1960,2000
1960 DA$="": GOSUB 2620: GOTO 1870
1970 GOSUB 2960
1980 GOTO 590
1990 COM STOP
2000 LOCATE 25,5: PRINT "M-CH INPUT ■"
2010 COLOR@(36,5)-(36,5),6
2020 COM ON
2030 A$=INKEY$
2040 IF A$="" THEN GOTO 2030
2050 IF INSTR ("0123456789"+CHR$(13)+CHR$(28),A$)=0 THEN GOTO 2030
2060 IF A$=CHR$(13) THEN GOTO 2130
2070 IF A$=CHR$(28) THEN GOTO 1970
2080 B1$=B1$+A$
2090 COM STOP
2100 LOCATE 37,5: PRINT B1$
2110 COM ON

```



```

2120 GOTO 2030
2130 C=VAL(B1$)
2140 B1$=""
2150 IF C<100 THEN 2190
2160 C1=INT(C/100)
2170 C=C-100*C1
2180 DA$=CH$(C1)
2190 DA$=DA$+CH$(C)
2200 COLOR@(36,6)-(36,6),0
2210 GOSUB 2620
2220 COM STOP
2230 LOCATE 25,5: PRINT "
2240 COM ON
2250 GOTO 1870
2260 '
2270 '      OFFSET WRITE
2280 '
2290 COM STOP
2300 FQ=2
2310 LOCATE 25,4: PRINT "OFFSET FREQ. INPUT (MHZ)"
2320 LOCATE 25,8: PRINT ME$;" key then return to MENU"
2330 COLOR@(29,6)-(29,6),6
2340 COM ON
2350 L=8: M=6
2360 GOTO 850
2370 '
2380 '      SCAN CONTROL
2390 '
2400 COM STOP
2410 LOCATE 25,1 : PRINT "◆ SCAN STOP"
2420 LOCATE 25,2 : PRINT "◆ SCAN START"
2430 LOCATE 25,4 : PRINT ME$;" key then return to MENU"
2440 COM ON
2450 LOCATE 25,LY5
2460 COLOR@(25,LY5)-(25,LY5),6
2470 A$=INKEY$
2480 IF A$="" THEN GOTO 2470
2490 N=2: J=25: LY=LY5
2500 GOSUB 3050
2510 LY5=LY
2520 ON K GOTO 2470,2460,2530,2570
2530 COLOR@(25,LY5)-(25,LY5),0
2540 C=LY5-1
2550 ON LY5 GOTO 2560,2560
2560 DA$=CH$(C): GOSUB 2620: GOTO 2460
2570 GOSUB 2960
2580 GOTO 590
2590 '
2600 '      COMMAND OUTPUT
2610 '
2620 CNT$=CHR$(LY2-1)
2630 INS$=TX$+CNT$+DA$+FI$
2640 IF LY2<3 THEN 2660
2650 INS$=PR$+RE$+INS$:GOTO 2670
2660 INS$=PR$+CHR$(0)+INS$
2665 LOCATE 3,23 :PRINT "
2670 PRINT#1,INS$;
2680 DA$=""
2690 RETURN
2700 '
2710 '      ON COM
2720 '
2730 IF LOC(1)=0 THEN RETURN
2740 I$=INPUT$(LOC(1),#1):L=LEN(I$)
2750 FOR K=1 TO L
2760 P$=MID$(I$,K,1):M=ASC(P$)
2770 IF M=&HFC THEN V$="" :GOTO 2810
2780 IF M<16 THEN X$="0"+HEX$(M) ELSE X$=HEX$(M)
2790 IF M=&HFD THEN V$=Z$ :Z$="":X$=""
2800 Z$=X$+Z$
2810 NEXT K :IF V$="" THEN RETURN

```

```

2820 L=LEN(V$)
2830 'LOCATE 5,23: PRINT V$
2840 IF INSTR(V$, (RC$+"00FEFE"))<>0 THEN 3460
2850 IF LEFT$(V$,8)=("FA"+RC$+TC$+"FE") THEN LOCATE 5,23 :PRINT "N G"
2860 IF LEFT$(V$,8)=("FB"+RC$+TC$+"FE") THEN LOCATE 5,23 :PRINT "O K"
2870 IF L=32 THEN 3640
2880 S$="03"+RC$+TC$+"FE" :IF INSTR(V$,S$)<>0 THEN 3470
2890 S$="04"+RC$+TC$+"FE" :IF INSTR(V$,S$)<>0 THEN 3540
2900 S$="0C"+RC$+TC$+"FE" :IF INSTR(V$,S$)<>0 THEN 3700
2910 CX=POS(0): CY=CSRLIN
2920 I$="":RETURN
2930 '
2940 '      SUB-ROUTINE CLEAR
2950 '
2960 COM STOP
2970 FOR K=1 TO 11
2980 LOCATE 25,K: PRINT "          "
2990 NEXT K
3000 COM ON
3010 RETURN
3020 '
3030 '      SUB-ROUTIN
3040 '
3050 ON INSTR(CHR$(30)+CHR$(31)+CHR$(13)+CHR$(27)+CHR$(28),A$) GOTO 3070,3120,
      3170,3180,3220
3060 K=1: RETURN
3070 COM STOP
3080 LOCATE J,LY: PRINT "◆"
3090 COM ON
3100 IF LY=1 THEN LY=N ELSE LY=LY-1
3110 K=2: RETURN
3120 COM STOP
3130 LOCATE J,LY: PRINT "◆"
3140 COM ON
3150 IF LY=N THEN LY=1 ELSE LY=LY+1
3160 K=2: RETURN
3170 K=3: RETURN
3180 COM STOP
3190 GOSUB 3260
3200 COM ON
3210 K=1: RETURN
3220 K=4: RETURN
3230 '
3240 '      ADDRESS SET
3250 '
3260 LOCATE 5,2:PRINT "CONTROLLER";
3270 LOCATE 10,3:PRINT "          "
3280 LOCATE 5,3:INPUT "  ADDRESS  ",T$
3290 IF T$="" THEN LOCATE 16,3:PRINT HEX$(ASC(TX$));:GOTO 3310
3300 TX$=CHR$(VAL("&H"+T$))
3310 LOCATE 5,5:PRINT "TRANCEIVER";
3320 LOCATE 10,6:PRINT "          "
3330 LOCATE 5,6:INPUT "  ADDRESS  ",R$
3340 IF R$="" THEN LOCATE 16,6:PRINT HEX$(ASC(RE$));:GOTO 3360
3350 RE$=CHR$(VAL("&H"+R$))
3360 RC$=RIGHT$(("00"+HEX$(ASC(RE$))),2):TC$=RIGHT$(("00"+HEX$(ASC(TX$))),2)
3370 RETURN
3380 '
3390 '      STOP
3400 '
3410 CLOSE #1
3420 CONSOLE 0,25,1
3430 CLS
3440 END
3450 *FRQIN
3460 IF L<17 THEN 3540
3470 IF LEFT$(V$,2)="FF" THEN :LOCATE 6,12 :PRINT "-----":GOTO 3520
3480 FQ$=LEFT$(V$,10)
3490 FQ#=VAL(FQ$)/1E+06
3500 LOCATE 6,12
3510 PRINT USING "####.#####MHz";FQ#

```

```

3520 V$="" :RETURN
3530 *MODES
3540 IF L=12 THEN 3600
3550 IF LEFT$(V$,4)="0203" THEN MO$="C W -N" :GOTO 3620
3560 IF LEFT$(V$,4)="0204" THEN MO$="RTTY-N" :GOTO 3620
3570 IF LEFT$(V$,4)="0205" THEN MO$="F M -N" :GOTO 3620
3580 IF LEFT$(V$,4)="0005" THEN MO$="SSB(R)" :GOTO 3620
3590 MO$="----" :GOTO 3620
3600 C=VAL(LEFT$(V$,2))*4+1 :IF C>35 THEN MO$="----":GOTO 3620
3610 MO$=MID$(MDA$,C,4)
3620 LOCATE 16,9:PRINT MO$;"          ";V$=""
3630 RETURN
3640 FH$=LEFT$(V$,10):FL$=MID$(V$,13,10)
3650 LOCATE 5,16 :PRINT "UPPER/LOWER FREQUENCY"
3660 FH#=VAL(FH$)/1E+06 :FL#=VAL(FL$)/1E+06
3670 LOCATE 4,17
3680 PRINT USING "####.#####MHz -";FH#;:PRINT USING "####.#####MHz";FL#
3690 V$="" :RETURN
3700 LOCATE 5,19:PRINT "OFFSET FREQUENCY"
3710 OS$=LEFT$(V$,6):F#=VAL(OS$)/10#
3720 LOCATE 6,20:PRINT F#;"KHz          ":V$=""
3730 RETURN

```

# 5. SCHEMATIC DIAGRAM

