

# CHAPTER 1 . INTRODUCTION

## 1) OVERVIEW

12 BIT A/D-D/A CARD IS A HIGH PRECISION DATA CONVERSION SYSTEM. IT CONTAIN 1 CHANNEL 12 BIT DIGITAL TO ANALOG (SETTING JUMPER 1 FOR SELECT UNIPOLAR OR BIPOLAR), 16 CHANNELS 12 BIT ANALOG TO DIGITAL CONVERSION (UNIPOLAR) AND 8 SETS CHANGE-ABLE I/O ADDRESS.

## 2) SPECIFICATION

D/A :

- \* 12 BIT RESOLUTION, 1 CHANNEL.
- \* OUTPUT VOLTAGE ADJUST BY VR.
- \* UNIPOLAR (0-8.5V) OR BIPOLAR (-8.5V - +8.5V) OUTPUT.
- \* CURRENT SETTING TIME 500nsec.
- \* NONLINEARITY 0.2%.

A/D :

- \* 12 BIT RESOLUTION, 16 CHANNELS.
- \* INPUT VOLTAGE RANGE 0-8.5V (ADJUST BY VR).
- \* UNIPOLAR.
- \* SUCCESSIVE APPROXIMATION METHOD.
- \* CONVERSION TIME 60usec (EACH CHANNEL).

I/O PORT ADDRESS : SELECT BY JP2

&H280 - &H287,    &H288 - &H28F,    &H290 - &H297,  
&H298 - &H29F,    &H2A0 - &H2A7,    &H2A8 - &H2AF,  
&H2B0 - &H2B7,    &H2B8 - &H2BF

POWER COMSUMPTION : 2.2w.

CARD SIZE: 14.5 cm X 11 cm.

## 3) PACKING.

- \* 12 BIT A/D-D/A ADAPTER.
- \* 26 PIN TO 25 (MALE) FLAT CABLE.
- \* COMPLETE USER'S MANUAL.
- \* DEMO SOFTWARE.

## CHAPTER 2 . OPERATING PROCEDURE

### 1) JUMPER SETTING :

JP2		I/O ADDRESS
1&2, 4&5, 7&8	SHORT	&H280 - &H287
2&3, 4&5, 7&8	SHORT	&H288 - &H28F
1&2, 5&6, 7&8	SHORT	&H290 - &H297 (DEFAULT)
2&3, 5&6, 7&8	SHORT	&H298 - &H29F
1&2, 4&5, 8&9	SHORT	&H2A0 - &H2A7
2&3, 4&5, 8&9	SHORT	&H2A8 - &H2AF
1&2, 5&6, 8&9	SHORT	&H2B0 - &H2B7
2&3, 5&6, 8&9	SHORT	&H2B8 - &H2BF

JP1 : OPEN : D/A UNIPOLAR OUTPUT.  
SHORT: D/A BIPOLAR OUPUT.

JP3 : 1&2 SHORT:SELECT BATTERY REFERENCE VOLTAGE.  
2&3 SHORT:SELECT INTERNAL REFERENCE VOLTAGE.

### 2) I/O ADDRESS DEFAULT : &H290 - &H297

PORT = 656 (&H290)

ANALOG TO DIGITAL (A/D) PROCEDURE :

- (1) OUTPUT CHANNEL NUMBER TO PORT  
OUT PORT, CHANNEL
- (2) CLEAR REGISTER  
~~OUT~~ (PORT + 3),  $\phi$
- (3) START CONVERT  
FOR I=1 TO 7  
A = INP (PORT + 4)  
NEXT I  
FOR I=1 TO 7  
A = INP (PORT + 5)  
NEXT I
- (4) READ HIGH 4-BITS  
B = INP (PORT + 2) ~~2A~~  
HB = (B/16 - INT(B/16)) \* 16
- (5) READ LOW BYTE (8-BITS)  
LB = INP (PORT + 1)
- (6) DATA :  
A/D = HB \* 256 + LB

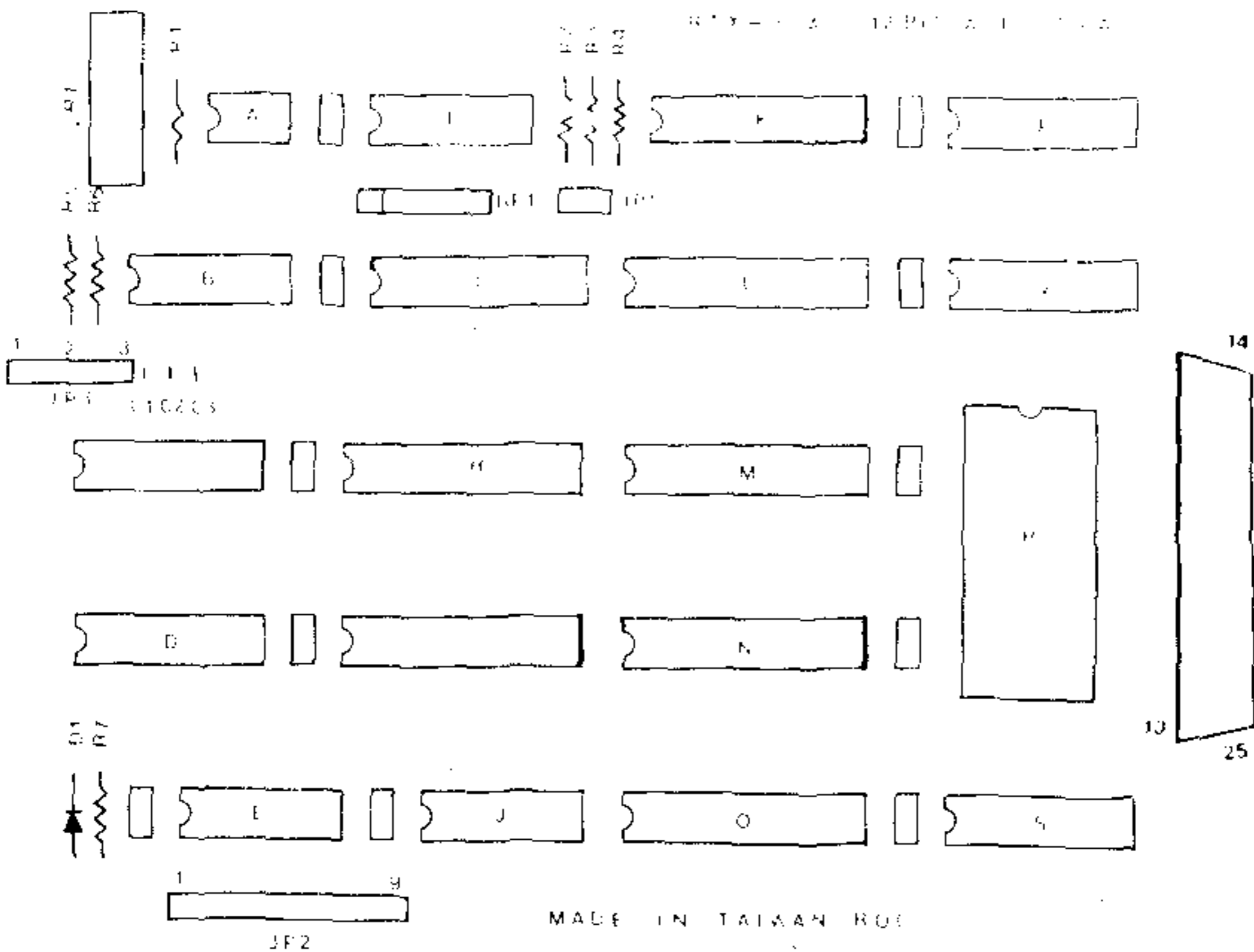
DIGITAL TO ANALOG (D/A) PROCEDURE :

- (1) OUTPUT HIGH 4-BITS  
OUT PORT+7, HDATA
- (2) OUTPUT LOW 8-BITS  
OUT PORT+6, LDATA

**NOTE** : I/O PORT ADDRESS (&H290 - &H297)

- &H 290 : OUTPUT A/D CHANNEL NUMBER (LOW 4 BIT)
- 291 : INPUT A/D LOW 8 BIT DATA
- 292 : INPUT A/D HIGH 4 BIT DATA (LOW NIBBLE)
- 293 : CLEAR A/D REGISTER
- 294 : A/D CONVERSION LOOP (LOW)
- 295 : A/D CONVERSION LOOP (HIGH)
- 296 : OUTPUT D/A LOW 8 BIT DATA
- 297 : OUTPUT D/A HIGH 4 BIT DATA (LOW NIBBLE)

### 3) A/D-D/A ADAPTER LAYOUT



### CHAPTER 3. D TYPE CONNECTOR PINOUT

PIN	SIGNAL	PIN	SIGNAL
13	GND	25	-12V
12	D/A OUT	24	A/D-CH8
11	+5V	23	A/D-CH9
10	GND	22	A/D-CH10
9	A/D-CH0	21	A/D-CH11
8	A/D-CH1	20	A/D-CH12
7	A/D-CH2	19	A/D-CH13
6	A/D-CH3	18	A/D-CH14
5	A/D-CH4	17	A/D-CH15
4	A/D-CH5	16	GND
3	A/D-CH6	15	-5V
2	A/D-CH7	14	GND
1	+12V		

1	2	3	4	5	6	7	8	9	10	11	12	13
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14	15	16	17	18	19	20	21	22	23	24	25	

## CHAPTER 4 . BASIC PROGRAM LIST

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10 CLS:PORT=656
20 LOCATE 5,18:PRINT "12 BIT AD-DA CONVERSION CARD"
30 LOCATE 6,18:PRINT "=====
40 LOCATE 9,20:PRINT "1. D/A CONVERSION DEMO"
50 LOCATE 11,20:PRINT "2. A/D CONVERSION DEMO"
60 A$=INKEY$:IF A$="" THEN 60
70 IF A$="1" THEN 200
80 IF A$="2" THEN 400
90 GOTO 10
200 CLS
202 LOCATE 5,15:PRINT "D/A CONVERSION DEMO"
204 LOCATE 7,15:PRINT "OUTPUT WAVEFORM FROM D/A
    PORT"
206 LOCATE 9,15:PRINT "PRESS ANY KEY RETURN MENU"
210 OUT PORT +6,0
220 FOR I = 0 TO 15
230 OUT PORT+7,I
240 NEXT I
250 A$=INKEY$:IF A$="" THEN 210
260 GOTO 10
400 CLS
410 FOR CHANNEL = 0 TO 15
420 GOSUB 550
430 B=INP(PORT+2)
440 C=INP(PORT+1)
450 D=(B-16*(INT(B/16)))*256+C
460 PRINT "    CHANNEL= ";CHANNEL,"DATE= ";D
470 NEXT CHANNEL
480 PRINT:PRINT :PRINT
490 GOTO 410
550 OUT PORT+3,0
560 OUT PORT+0,CHANNEL
570 FOR I=1 TO 7:A=INP(PORT+4):NEXT I
580 FOR I=1 TO 7:A=INP(PORT+5):NEXT I
590 RETURN

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## CHAPTER 5 . INSTALLATION

1. TURN OFF YOUR SYSTEM UNIT'S POWER OFF.
2. TURN YOUR EXTERNALLY ATTACHED DEVICE'S POWER OFF.
3. UNPLUG YOUR SYSTEM UNIT'S POWER CORD FROM THE WALL OUTLET.
4. DISCONNECT ALL CABLES FROM THE BACK OF YOUR SYSTEM UNIT AND NOTE THEIR LOCATION.
5. REMOVE THE COVER.
6. REMOVE THE SCREW THAT HOLDS THE EXPANSION SLOT'S COVER IN PLACE. SAVE THE SCREW FOR THE INSTALLATION OF THE ADAPTER.
7. HOLD THE CARD BY THE TOP AND FIRMLY PRESS IT INTO THE EXPANSION SLOT.
8. INSTALL THE SCREW YOU REMOVED IN STEP 6.
9. CHECK JUMPER SETTING AGAIN.
10. IF YOU HAVE ANY OTHER INTERNAL OPTION THAT NEED TO BE INSTALLED, INSTALL THEM NOW.
11. INSTALL THE SYSTEM UNIT'S COVER, MAKE SURE THAT THE COVER IS UNDER THE RAIL ON THE FRAME AND LIFT THE COVER UP AGAINST THE RAIL AND SLIDE IT ONTO YOUR SYSTEM UNIT.
12. POSITION THE BACK PANEL ON YOUR SYSTEM UNIT, AND PRESS IT INTO PLACE.
13. INSTALL ALL CABLES FROM THE BACK OF YOUR SYSTEM UNIT THAT YOU REMOVED.
14. BACKUP THE DISKETTE AND PUT IT IN THE SAFE PLACE.
15. RUN THE EXAMPLE PROGRAM THAT IT WILL DISPLAY :

WHICH SELECTION DO YOU WANT ?

1. D/A CONVERSION DEMO
2. A/D CONVERSION DEMO

16. IF YOU SELECT " 1. D/A CONVERSION DEMO ", PIN 2 OF D-TYPE CONNECTOR WILL OUTPUT 16 STEPS SAW-TOOTH WAVE.
17. IF YOU SELECT " 2. A/D CONVERSION DEMO ", SCREEN WILL DISPLAY EACH CHANNEL VALUE (FROM 0 TO 4095 OF THE 16 CHANNELS).