

TEST PROCEDURE FOR DUAL FUNCTION GENERATOR BOARD
ASSY.#D36-E-143
SCHEMATIC #D36-E141-5

THIS BOARD CONSISTS OF TWO IDENTICAL SECTIONS. SECTION ONE WILL REFER TO THE ONE THAT IS AT THE P2 CONNECTOR. EACH SECTION OF THE BOARD RESPONDS TO FOUR ADDRESSES. SECTION ONE'S ADDRESSES ARE C0, C1, C8, & C9. ADDR C0 IS WRITE TO MEMORY, ADDR. C1 IS A WRITE TO THE CONTROL REG., ADDR. C8 IS WRITE TO FLEX BUFFER CONTROL, AND ADDR. C9 IS WRITE TO D/A OR READ A/D. SECTION TWO IS THE SAME EXCEPT THAT IT'S ADDRESSES ARE C2, C3, CA, & CB.

IF THIS IS A NEW BOARD THE PROGRAMMABLE CHIPS WILL HAVE TO BE PROGRAMMED. SEE PAGE 7 FOR DETAILS.

CHECK THAT JUMPER WIRES ARE INSTALLED AT:

- E1-E3 AND E9-E11---A/D BIPOLAR
- E7-E8---MEMORY SELECT
- E5-E14 ---PRIORITY OUT TO PRIORITY IN, ALLOWS BOTH SECTIONS TO SHARE BUS.

TEST EQUIPMENT NEEDED....

- 1) QUME MONITOR & KEYBOARD
- 2) DATACON TEST FIXTURE WITH 86/35 CPU BOARD, MEMORY BD, AND MULTIBUS TO DATACON MASTER INTERFACE BD.
(SET SWITCHES ON MASTER INTERFACE BD. TO...
U46-00000000, U51-00000000, U55-00000000
- 3) TEST PROMS FOR 86/35---SIMULATES MANUAL HEAD
- 4) EUROCARD TEST FIXTURE—SEE P? FOR SETUP.
- 5) HP 6236B POWER SUPPLY-CONNECTS TO EUROCRATE POWER BUSES, WT=-15V, ORG=+15V, BLK=GND, RED=5V
- 6) DMM
- 7) SIGNAL GENERATOR---WITH SINE & TRIANGULAR OUTPUTS
- 8) SCOPE
- 9) EUROCARD EXTENDER BOARD

THIS TEST USES THE DEFAULT SETTINGS OF THE QUME MONITOR. NONE OF THE SETTINGS SHOULD HAVE TO BE CHANGED.

SETTINGS CAN BE CHECKED BY PRESSING (CTRL+SHIFT+SETUP).
DISPLAY IS : ON LINE, CHAR MODE, FDX,PROT OFF,KB ON,AUX OFF,
(MON) OFF, GRAPH OFF,9600.

ARROW KEYS MOVE CURSOR LEFT & RIGHT, SPACE BAR CHANGES SETTINGS.
UP/DOWN ARROWS MOVE THROUGH 5 "SET MENUS". SETTINGS ARE:

- SET 1:KEYS:.,REPEAT ON, CLICK OFF,MARGIN BELL OFF,
E.O.M.:NUL
- SET 2:LINE WRAP ON,LINE FEED OFF,SCROLL ON,
DISPLAY PE OFF,STD VID,X-ON & DTR
- SET 3:DATA BIT 8,BIT 8 0,PARITY OFF,PARITY BIT ODD
STOP BIT 1, EMULATION QVT101B
- SET 4:CURSOR BLOCK, CURSER BLINK, HERE IS: ,
TIME OFF, FREQ 60
- SET 5: XPARENT OFF, KB TYPE:US, STATUS LINE OFF,
AUX/KB:AUX

PRESSING "SETUP" WILL EXIT SETUP MENU.

!!! NOTE: DO NOT PLUG BOARD IN UNLESS SWITCHES S1,S2,S3, & S4 ARE SET TO THE SPECIFIED CONFIGURATION. DAMAGE TO THE BOARD WILL RESULT.

- 1) CHECK BOARD FOR VOLTAGE TO GND SHORTS.
- 2) SET SWITCHES ON BOARD UNDER TEST FOR D/A MODE.
 S2—1,3 & 5 AND S4—1,3, 5 CLOSED.
 SET D/A OUTPUT RANGE TO +/- 10V.
 S1-2,4 & 7 AND S3-2,4, & 7 CLOSED.
- 3) ON TEST FIXTURE SET SWITCH TO FG 1.
- 4) TURN POWER ON TO ALL TEST EQUIP.
- 5) MONITOR SHOULD COME UP WITH MESSAGE....
 INITIALIZATION COMPLETE
 THIS IS A TEST PROGRAM FOR THE 86/35 BOARD
 INPUT COMMAND (X=TRANSMIT, E=EXAMINE)
- 6) MAKE SURE CAPS LOCK IS ON
- 7) FOR EXAMPLE: TO SEND DATA TYPE X, CR
 SELECT A-LINK TO OUTPUT DATACON TO J1, B-LINK FOR J2
 COMMAND XX (DATA IN HEX)
 ADDR XX (ADDRESS IN HEX)
 MAG XXXX (MAGNITUDE DATA IN HEX)
 S OR C (SINGLE OR CONTINUOUS MODE)
- 8) EXAMINE HAS THE SAME FORMAT AS TRANSMIT BUT5 DISPLAYS THE MAGNITUDE AND STATUS READBACK.
- 9) CONNECT DVM TO D/A OUTPUT ON TEST FIXTURE.
- 10) FOLLOW TABLE I TO CHECK START/STOP FUNCTIONS. LED OUTPUT IS ON BOARD UNDER TEST.

TABLE I

XMIT/EXAM	LINK	COM	ADDR	MAG	S/C	OUTPUT
X	A	32	C1	0000	S	
(PRESS STOP SW ON TEST SET)						LED ON (DS1)
“START			“			LED OFF
“STOP			“			LED ON
X	A	02	C1	0001	S	LED OFF
X	A	42	C1	0000	S	LED ON
SET SWITCH ON TEST SET TO FG 2						
X	A	32	C3	0000	S	
(PRESS STOP SWITCH ON TEST SET)						LED ON (DS4)
“START			“			LED OFF
“STOP			“			LED ON
X	A	02	C3	0001	S	LED OFF
X	A	42	C3	0000	S	LED ON

THIS CHECKS BOTH THE MANUAL AND DATACON START/STOPS.

11) AT THIS POINT BOTH LED'S SHOULD BE ON. SET SWITCH ON TEST SET TO FG 1. FOLLOW TABLE II TO CHECK D/A OUTPUT AT +10.00V FOR FFF(H), 0.00V FOR 800(H). AND -10.00V FOR 000(H). CHECK BOTH D/A AND BUFFERED D/A OUTPUTS WITH DMM.

TABLE II

XMIT/EXAM	LINK	COM	ADDR	MAG	S/C	OUTPUT
SET SWITCH ON TEST SET TO FG 1						
X	A	--	C9	8000	S	0.00V R9 ADJ
X	A	--	C9	FFF0	S	+10.00V R10 ADJ
X	A	--	C9	0000	S	-10.00V
SET SWITCH ON TEST SET TO FG 2						
X	A	--	CB	8000	S	0.00V R21 ADJ
X	A	--	CB	FFF0	S	+10.00V R22 ADJ
X	A	--	CB	0000	S	-10.00V

12) ON BOARD CLOSE S2-2,4 & 6 AND S4_2,4 & 6—A/D MODE.
ON TEST SET SELECT FG 1.

NOTE: ADDR AND SWITCHES IN PARENTHESIS ARE FOR THE SECOND SECTION OF THE BOARD

X	A	82	C1(C3) 0000	S
E	A	--	C9(CB)-----	C

MONITOR A/D VOLTAGE T-P WITH DMM. SET A/D VOLTAGE SWITCH ON TEST SET TO ON. TURN VOLTAGE ADJ. COUNTERCLOCKWISE UNTIL VOLTAGE ON METER READS -10.00V. DATA READBACK ON SCREEN SHOULD BE OUTPUT OF A/D. CHECK THAT MAG. BITS CHANGE AS VOLTAGE IS VARIED BETWEEN -10.0V AND +10.0V. AN ERROR OF 2 OR 3 LSB'S SHOULD BE ACCEPTABLE.

STS LED ON TEST SET SHOULD BE FLASHING.

VOLTAGE	STATUS/MAG
-10.00V	0000/0000 ADJ. R12(R24)
0.00V	0000/8000
+10.00V	0000/FFF0 ADJ. R11 (R23)

SET SWITCH ON TEST SET TO FG 2 AND REPEAT STEP #12
THEN TURN A/D VOLTAGE SWITCH TO OFF

13) SET A/D INPUT SWITCH ON TEST SET TO 20V p-p. CONFIGURE BOARD FOR A/D MODE BY CLOSING S2-2,4 & 5 AND S4-2,4 & 5. THIS SETS BOARD TO A/D MODE AND STORES DATA TO MEMORY. ON TEST SET SELECT FG 1.

14) SET A SIGNAL GENERATOR OUTPUT FOR A +/-10Vp SINEWAVE AT 20HZ.
CONNECT D/A OUTPUT TO SCOPE. FOLLOW TABLE III.

NOTE: ADDR AND SWITCHES IN PARENTHESIS ARE FOR THE SECOND SECTION OF THE BOARD. POSITION SWITCH ON TEST SET TO FG 2 THEN STEP THROUGH TABLE III A SECOND TIME USING THESE VALUES AND USE A TRIANGLE FUNCTION AS AN INPUT INSTEAD OF A SINEWAVE. TABLE III MUST BE COMPLETED FOR FG 1 AND FG 2 WITHOUT TURNING OFF THE POWER.

TABLE III

XMIT/EXAM	LINK	COM	ADDR	MAG	S/C	OUTPUT
(S2-2,4 & 5 AND S4-2,4 & 5 CLOSED)						
X	A	37	C1 (C3)	0000	S	(WRITE CONTROL)
X	A	20	C8 (CA)	----	S	(FLEX BUFFER)
PRESS START ONCE.						
X	A	37	C1 (C3)	0000	S	
X	A	21	C8 (CA)	0000	S	(BLOCK 0)
SET SIGNAL GEN. TO TRIANGULAR. PRESS START ONCE.						
X	A	22	C8 (CA)	-----	S	(BLOCK 2)
SET SIGNAL GEN. TO SQUARE WAVE. PRESS START ONCE.						
X	A	23	C8 (CA)	-----	S	(BLOCK 3)
SET SIGNAL GEN. TO TRIANGULAR. PRESS START ONCE.						
SET S2 (S4) SO THAT POS. 1,3, & 5 ARE CLOSED.						
X	A	10	C8 (CA)	-----	S	(OUTPUT 4 BLOCKS)
X	A	02	C1 (C3)	0001	S	

SYNC SCOPE ON THE RISING EDGE OF ECLK, U-23(U-38) PIN 14.

OUTPUT SHOULD BE THE ABOVE 4 WAVEFORMS.

PRESS RESET SWITCH, OUTPUT SHOULD STOP WHILE SWITCH IS PRESSED.

YOU SHOULD SEE ON SCOPE APPROX. 2 CYCLES OF THE SINEWAVE. NEXT BLOCK WILL BE A TRIANGULAR. A SQUARE WAVE, AND A TRIANGULAR. CHECK THAT OUTPUTS ARE CLEAN, NO DROP OUTS.

X	A	00	C1 (C3)	0000	S	
OUTPUT SHOULD BE AT -10 VOLTS.						
X	A	02	C1 (C3)	0001	S	

THE 4 WAVEFORMS SHOULD BE AT THE OUTPUT.

APPROX. 2 CYCLES OF EACH WAVEFORM SHOULD BE SEEN ON THE SCOPE WITH AN AMPLITUDE OF +/-10V. THIS IS A 4K BLOCK OF MEMORY DATA.

	OUTPUT
SET S1(S3) -2,4,5 & 7 TO CLOSED POS.	+/- 5V
SET S1(S3) -2,3,5 & 7 TO CLOSED POS.	+/- 2.5V
SET S1(S3) -1,4,5 & 7 TO CLOSED POS.	0V TO +10V
SET S1(S3) -1,3,5 & 7 TO CLOSED POS.	0V TO +5V
SET S1(S3) -2,4 & 7 TO CLOSED POS.	+/- 10V

SET UP SIGNAL GENERATOR FOR A SINEWAVE AT 20 Hz,

SET SWITCH ON TEST SET TO FG 2. GO TO TOP OF TABLE III AND CHECK SECTION 2.

15) SET SWITCH ON TEST SET TO FG 1. FOLLOW TABLE IV.

TABLE IV

XMIT/EXAM	LINK	COM	ADDR	MAG	S/C	OUTPUT
SET S2 (S4)-2, 4 & 5 TO CLOSED.						
X	A	77	C1 (C3)	0000	S	
X	A	30	C8 (CA)	-----	S	

SET SIGNAL GENERATOR TO 20Hz AND +/-5Vp.

SET A/D INPUT SWITCH TO 10V.

PRESS START.

SET S2 (S4) -1, 3 & 5 TO CLOSED.

X	A	32	C1 (C3)	0000	S	
---	---	----	---------	------	---	--

PRESS START. OUTPUT SHOULD NOW BE ONE 4K BLOCK OF MEMORY. APPROX. 8 CYCLES OF THE WAVEFORM AT +/-10V SHOULD BE SEEN BEFORE IT REPEATS. CHECK THAT OUTPUT HAS NO DROP OUTS.

SET SWITCH ON TEST SET TO FG 2.

SET SIGNAL GENERATOR TO OUTPUT A TRIANGULAR WAVE.

REPEAT TABLE IV FOR SECTION 2.

TOGGLE SWITCH ON TEST SET BETWEEN FG 1 AND FG 2 AND CHECK THAT FG 1 IS OUTPUTTING A TRIANGULAR WAVE. SET SWITCH TO FG 1.

16) FOLLOW TABLE V.

TABLE V

XMIT/EXAM	LINK	COM	ADDR	MAG	S/C	OUTPUT
X	A	02	C1 (C3)	0000	S	100K LED ON
X	A	06	C1 (C3)	0000	S	10K LED ON
X	A	0A	C1 (C3)	0000	S	1K LED ON
X	A	0E	C1 (C3)	0000	S	NO LED ON

SET SIGNAL GENERATOR TO OUTPUT A TTL SQUARE WAVE AT 10KHz.

CONNECT TO EXTERNAL CLOCK INPUT ON THE TEST SET.

TURN ON EXT CLK SWITCH, EXT LED SHOULD GO ON.

CHECK FOR D/A OUTPUT ON SCOPE, VARY SIGNAL GEN. FREQ. AND CHECK THAT D/A OUTPUT FREQ. VARIES.

SET SWITCH ON TEST SET TO FG 2.

TURN EXT CLK SWITCH TO OFF.

REPEAT TABLE V FOR SECTION 2.

17) SET SWITCHES ON TEST SET TO FG 1 AND A/D INPUT TO 20V. SET SIGNAL GENERATOR TO OUTPUT A TRIANGULAR WAVE AT 20 Hz +/- 5V.
 SET S2 (S4) -2, 4 & 5 TO CLOSED.
 CONNECT SIGNAL GENERATOR TO A/D INPUT ON THE TEST SET.

XMIT/EXAM	LINK	COM	ADDR	MAG	S/C	OUTPUT
X	A	37	C1 (C3)	0000	S	
X	A	30	C8 (CA)	-----	S	

PRESS START ONCE.

SET S2 (S4) -1, 3 & 5 TO CLOSED.

CONNECT D/A OUTPUT TO SCOPE. THIS SECTION OF THE TEST WILL CHECK THE DATACON WRITE TO MEMORY BY SENDING ZERO'S TO THE FIRST SEVERAL MEMORY LOCATIONS IN EACH 1K BLOCK OF MEMORY.
 SYNC SCOPE ON RISING EDGE OF ECLK U-23(U-38) PIN 14.

TABLE VI

XMIT/EXAM	LINK	COM	ADDR	MAG	S/C	OUTPUT
X	A	02	C1 (C3)	0001	S	
X	A	00	C8 (CA)	-----	S	(FIRST 1K)
X	A	00	C0 (C2)	0000	S	1 ST BIT -10V
X	A	01	C0 (C2)	0000	S	2nd BIT -10V
X	A	02	C0 (C2)	0000	S	3rd BIT -10V
X	A	05	C8 (CA)	-----	S	(SECOND 1K)
X	A	00	C0 (C2)	0000	S	1 ST BIT -10V
X	A	01	C0 (C2)	0000	S	2nd BIT -10V
X	A	02	C0 (C2)	0000	S	3rd BIT -10V
X	A	0A	C8 (CA)	-----	S	(THIRD 1K)
X	A	00	C0 (C2)	0000	S	1 ST BIT -10V
X	A	01	C0 (C2)	0000	S	2nd BIT -10V
X	A	02	C0 (C2)	0000	S	3rd BIT -10V
X	A	0F	C8 (CA)	-----	S	(FOURTH 1K)
X	A	00	C0 (C2)	0000	S	1 ST BIT -10V
X	A	01	C0 (C2)	0000	S	2nd BIT -10V
X	A	02	C0 (C2)	0000	S	3rd BIT -10V

SET SWITCH ON TEST SET TO FG 2 AND REPEAT FROM STEP 17 FOR SECTION 2.

PROGRAMMABLE CHIPS

THERE ARE 11 CHIPS THAT HAVE TO BE PROGRAMMED FOR USE IN THIS BOARD. ONE GAL 16V8, EIGHT GAL 20V8'S AND TWO PAL 22V10'S THE FILES THAT HAVE TO BE LOADED ARE..

	CHECKSUM	LINK COUNT
CORE.JED FOR U-17 (16V8)	5457	00697
FGSTAT.A.JED FOR U-26 & U-41 (20V8)	690D	00860
FGSTAT.B.JED FOR U-27 & U-42 (20V8)	61AD	00800
FGCNTRLA.JED FOR U-30 & U-45 (20V8)	BF0D	01497
FGCNTRLB.JED FOR U-31 & U-46 (20V8)	5DDB	00757
FGFLEX.JED FOR U-23 & U-38 (22V10)	84FF	01069

THESE FILES CAN BE FOUND ON THE DISK MARKED PROGRAMMABLE CHIP FILES IN THE DIRECTORY CUPLFILE. INSERT DISK INTO PC. (PC SHOULD BE AT C: PROMPT.)

SET PC TO OUTPUT DATA TO STAG BY...

TYPE—MODE COM1:24,N,8,1{CR} 22V10 AMD 24 PIN AMPAL

IF USING STAG SYSTEM Z PROGRAMMER USE PLUGIN MODULE ZM-2200.

IF USING STAG SYSTEM 3000. USE PLUGIN ZM-3000.

SET STAG PROGRAMMER FOR DEVICE: NATIONAL GAL16V8 BY..

SET DEVICE TO NATIONAL 20/24 PIN GAL (ENTER)

SELECT 16V8 (ENTER)

20V8 NAT 24 PIN GAL/MAPL

SET SYSTEM....

INTERFACE:RS232C1 BAUD RATE:2400 WORD LENGTH:8

PARITY:OFF STOP BITS:1 PRESS (ENTER)

SET SOFTWARE...

FORMAT:JEDEC CNTL/Z AT EOF:OFF PRESS (ENTER)

SET PROGRAM CONTROL...

SECURITY FUSE:INTACT AUTO VECTOR TEST: OFF

PRESS (ENTER)

SET MISCELLANEOUS....

HORN:ON REMOTE I/O: RS232C1 PASSTHROUGH:OFF

PRESS (RESET)

LOAD STAG WITH FILE....

ON THE STAG SELECT I/O FROM SYSTEM MENU. SELECT INPUT. (ENTER) CURSOR SHOULD BE IN UPPER LEFT CORNER. ON PC TYPE THE FOLLOWING COMMAND, COPY A:\CUPLFILE\ (FILE NAME) . JED COM1 (CR)

CURSOR WILL MOVE DOWN ON THE STAG WHILE FILE LOADS.

INSERT CHIP INTO THE SOCKET TO THE RIGHT OF THE LED THAT IS ON.

AFTER LOAD IS COMPLETE PRESS RESET, THEN PROG KEY THEN (ENTER) TO LOAD THE CHIP. RELOAD STAG USING THE CORRECT FILE NAME AND DEVICE TYPE FOR EACH CHIP BEING PROGRAMMED.