

## APPENDIX C - PAL EQUATIONS

### 1. Equation Definitions

$\overline{XXX}$  =Active Low Signal

\* =AND

→ =Go To

/ =Invert

: =On Clock Rising Edge

+ =OR

### 2. Digital IF PCB Assy

#### A. Digitizer Control PAL (U26015)

##### (1) Pin Assignments

PIN NO.	SIGNAL	PIN NO.	SIGNAL	PIN NO.	SIGNAL	PIN NO.	SIGNAL
1	CLK1	6	A14	11	OE	16	DRDY
2	CLK2	7	A15	12	DIG CLK	17	RAM WR
3	DS	8	TRIG	13	LOWB	18	RAMQ
4	STRB	9	RCO	14	NC	19	RAMI
5	A0	10	GND	15	ENA	20	V <sub>CC</sub>

##### (2) Equations

DIG CLK =/NC\*/RAM WR\*CLK2 + NC + RAM WR

LOWB =/(A14\*A15\*/STRB\*/DS)

NC :=RCO + NC\*TRIG

ENA :=/(RAM WR\*NC + /ENA\*NC)

DRDY :=/[RAM WR\*ENA + /DRDY\*/(A14\*A15\*/STRB\*/DS)\*TRIG]

RAM WR :=NC

RAMQ =CLK2\*/NC\*/RAM WR + (NC+RAM WR)\*/(A0\*/A14\*A15\*/STRB\*/DS)

RAMI =CLK2\*/NC\*/RAM WR + (NC+RAM WR)\*/(A0\*/A14\*A15\*/STRB\*/DS)

## B. DSP External RAM Access/System Interface PAL (U26016)

## (1) Pin Assignments

PIN NO.	SIGNAL	PIN NO.	SIGNAL	PIN NO.	SIGNAL	PIN NO.	SIGNAL
1	IS	6	R/ $\overline{W}$	11	A15	16	DPCS
2	STRB	7	A10	12	DPOE	17	SROE
3	DS	8	A11	13	RDYCS	18	SRWE
4	BUSY	9	A14	14	READY	19	SRCS
5	Q	10	GND	15	J	20	V <sub>CC</sub>

## (2) Equations

$$DPOE = /(A15 \cdot A14 / DS / STRB \cdot (R / \overline{W}))$$

$$RDYCS = /[(IS / STRB) \cdot (R / \overline{W})]$$

$$READY = /(IS + DS \cdot IS + /DS / A15 + /DS \cdot A15 / A14 + Q) \cdot BUSY$$

$$J = A15 \cdot A14 / DS$$

$$DPCS = /(A15 \cdot A14 / DS)$$

$$SROE = /[(A15 / A11 \cdot A10 / DS / STRB \cdot (R / \overline{W})) + /A15 \cdot A11 \cdot A10 / DS \cdot STRB \cdot (R / \overline{W})]$$

$$SRWE = /[(A15 / A11 \cdot A10 / DS / STRB) \cdot (R / \overline{W}) + /A15 \cdot A11 \cdot A10 / DS \cdot STRB \cdot (R / \overline{W})]$$

$$SRCS = /[(A15 \cdot A11 \cdot A10 / DS + /A15 \cdot A11 / A10) / DS]$$

## 3. Front Panel Pulse PCB Assy

## A. LCD Control PAL (U27029) Pin Assignments

PIN NO.	SIGNAL	PIN NO.	SIGNAL	PIN NO.	SIGNAL	PIN NO.	SIGNAL
1	NC	8	NC	15	NC	22	NC
2	CLK0	9	IO CH RDY	16	R83	23	ARDY
3	BALE	10	RESET	17	E	24	DIR
4	$\overline{WR}$	11	$\overline{BMCS0}$	18	R/W	25	$\overline{MEMR}$
5	$\overline{RD}$	12	R81	19	NC (Q2)	26	$\overline{MEMW}$
6	DT/RN	13	R82	20	NC (Q1)	27	NC (WAIT)
7	$\overline{PCS5}$	14	GND	21	NC (Q0)	28	V <sub>CC</sub>

## B. LCD Control PAL (U27029) Equations

$$E := /Q2 * Q1 + Q2 * /Q1 + Q2 * /Q0$$

$$R/W = / (DT / RN)$$

Q2 = Refer to Appendix C, 3C.

Q1 = Refer to Appendix C, 3C.

Q0 = Refer to Appendix C, 3C.

$$ARDY = / ( / WAIT + / IO CH RDY )$$

$$DIR = / ( / \overline{BMCS0} * / \overline{RD} )$$

$$\overline{MEMR} = / ( / \overline{BMCS0} * / \overline{RD} )$$

$$\overline{MEMW} = / ( / \overline{BMCS0} * / \overline{WR} )$$

$$WAIT := / Q2 * / Q1 * / Q0 + Q2 * Q1 * Q0$$

## C. LCD Control PAL (U27029) Wait State Assignments

$$S0 = / Q2 * / Q1 * / Q0 (000) \quad S0 := COND1 \rightarrow S1 + \rightarrow S0$$

$$S1 = / Q2 * / Q1 * Q0 (001) \quad S1 := COND0 \rightarrow S0 + \rightarrow S2$$

$$S2 = / Q2 * Q1 * / Q0 (010) \quad S2 := COND0 \rightarrow S0 + \rightarrow S3$$

$$S3 = / Q2 * Q1 * Q0 (011) \quad S3 := COND0 \rightarrow S0 + \rightarrow S4$$

$$S4 = Q2 * / Q1 * / Q0 (100) \quad S4 := COND0 \rightarrow S0 + \rightarrow S5$$

$$S5 = Q2 * / Q1 * Q0 (101) \quad S5 := COND0 \rightarrow S0 + \rightarrow S6$$

$$S6 = Q2 * Q1 * / Q0 (110) \quad S6 := COND0 \rightarrow S0 + \rightarrow S7$$

$$S7 = Q2 * Q1 * Q0 (111) \quad S7 := COND0 \rightarrow S0 + \rightarrow S7$$

Conditions:

$$COND0 = RESET + PCS5$$

$$COND1 = / PCS5 * ( / WR + / RD )$$



THIS PAGE INTENTIONALLY LEFT BLANK.