EK-1TU78-TM-003

TU78 Magnetic Tape Transport Technical Manual

Volume 1

Prepared by Educational Services
of
Digital Equipment Corporation

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DECUS	EDUSYSTEM	RSTS
UNIBUS	VAX	RSX
	VMS	IAS

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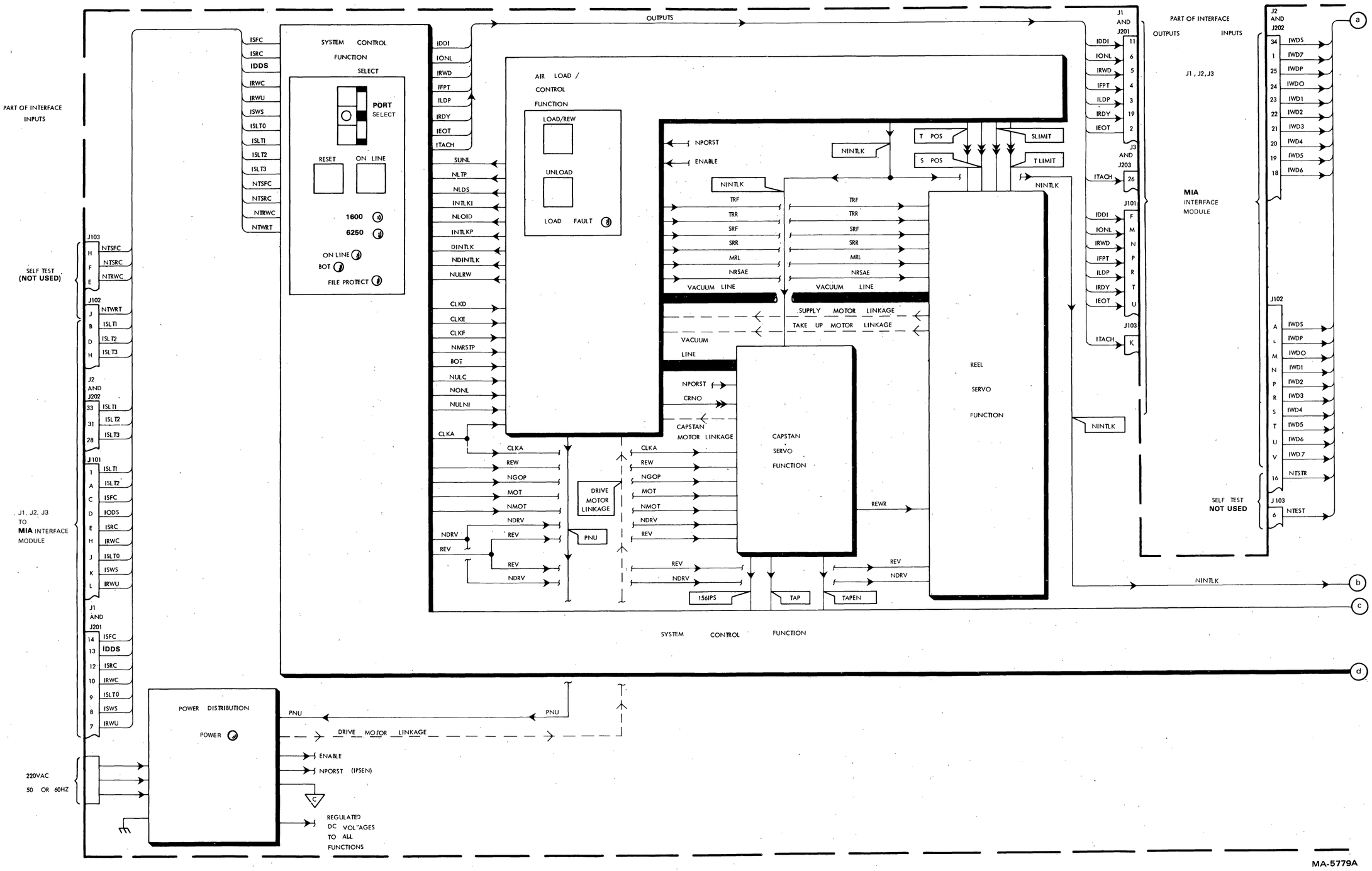


Figure 1 System Functional Block Diagram (Sheet 1 of 2)

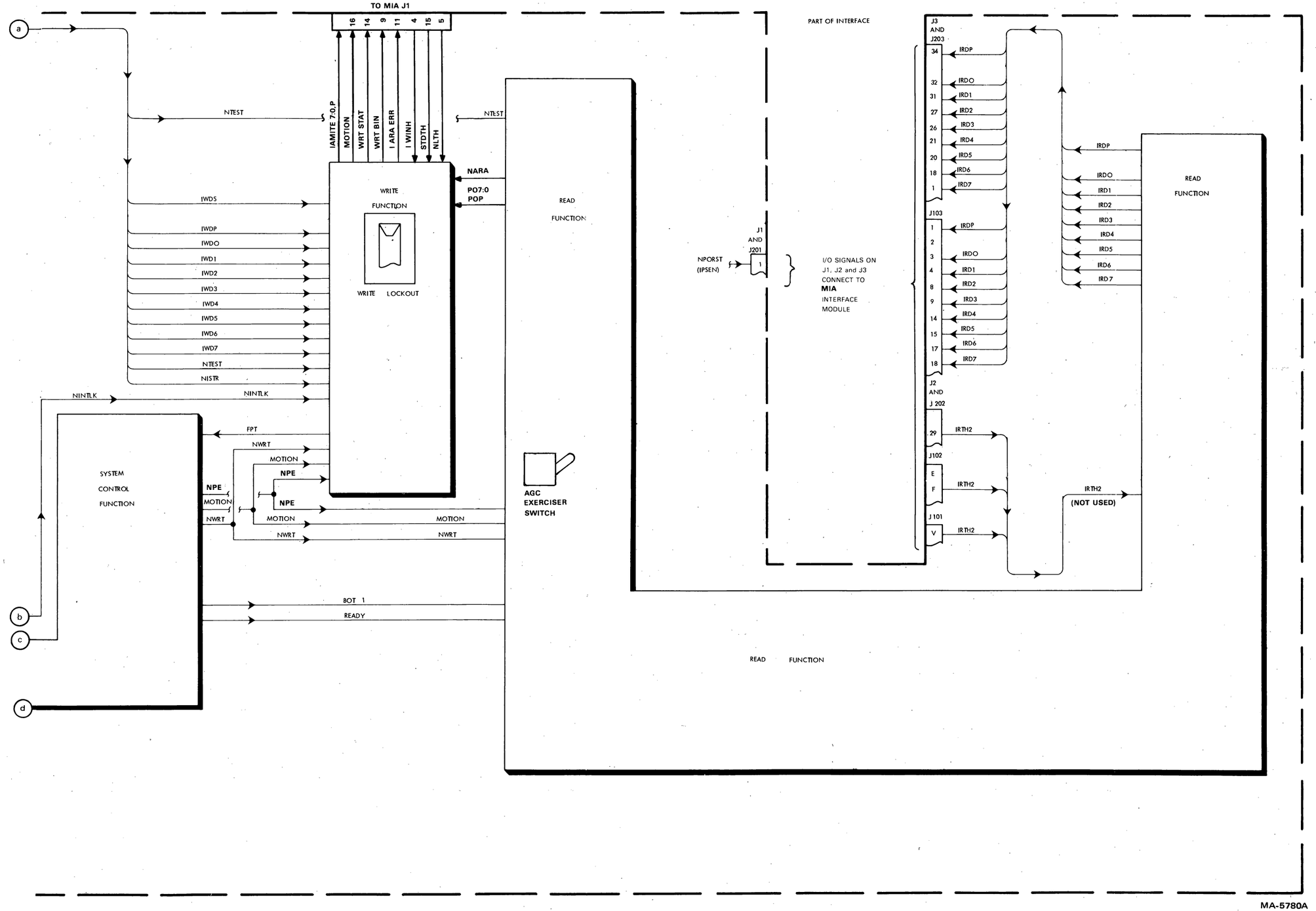


Figure 1 System Functional Block Diagram (Sheet 2 of 2)

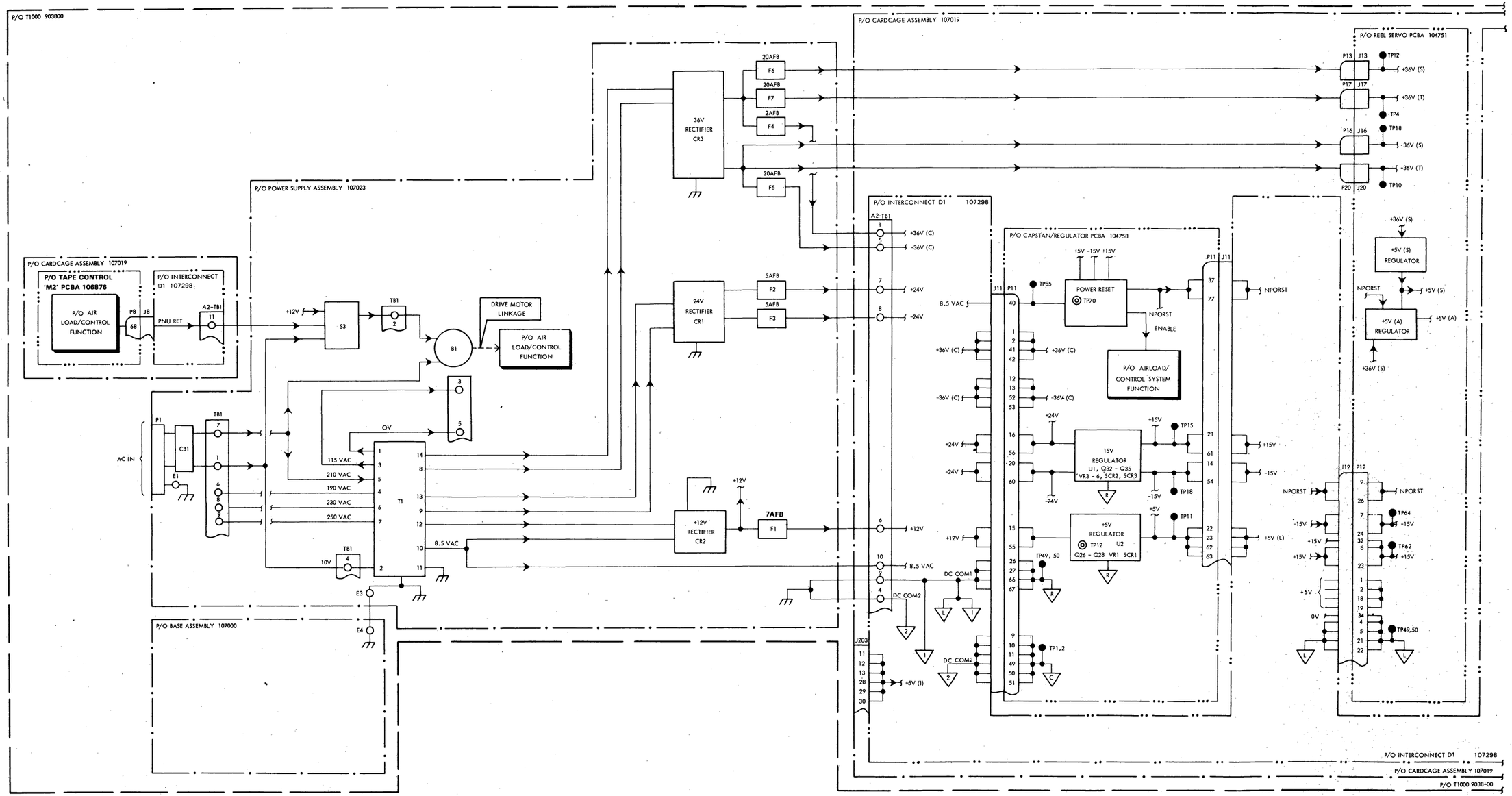


Figure 2 Power Supply and Distribution Functional Block Diagram
(Sheet 1 of 2)

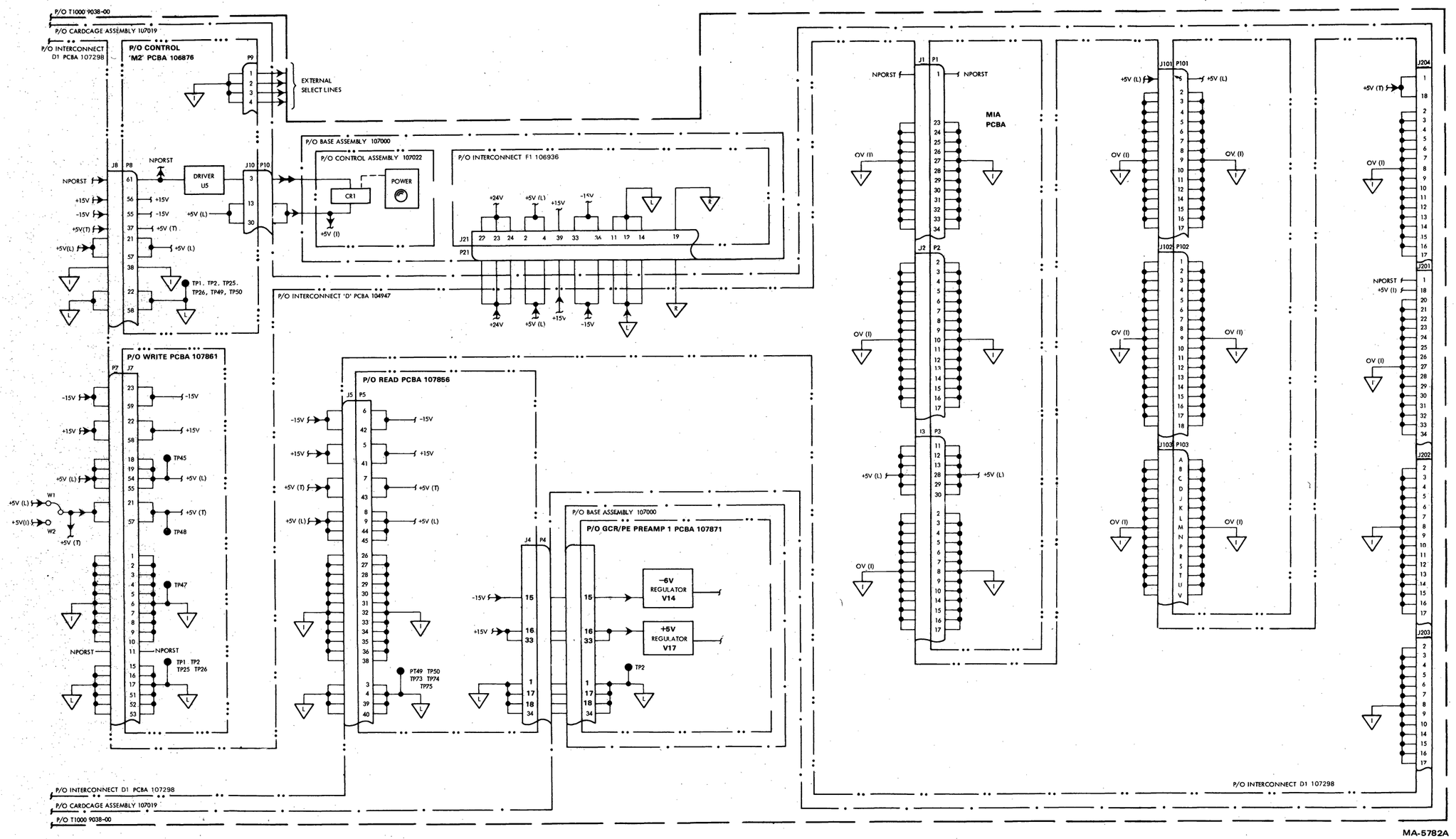


Figure 2 Power Supply and Distribution Functional Block Diagram
(Sheet 2 of 2)

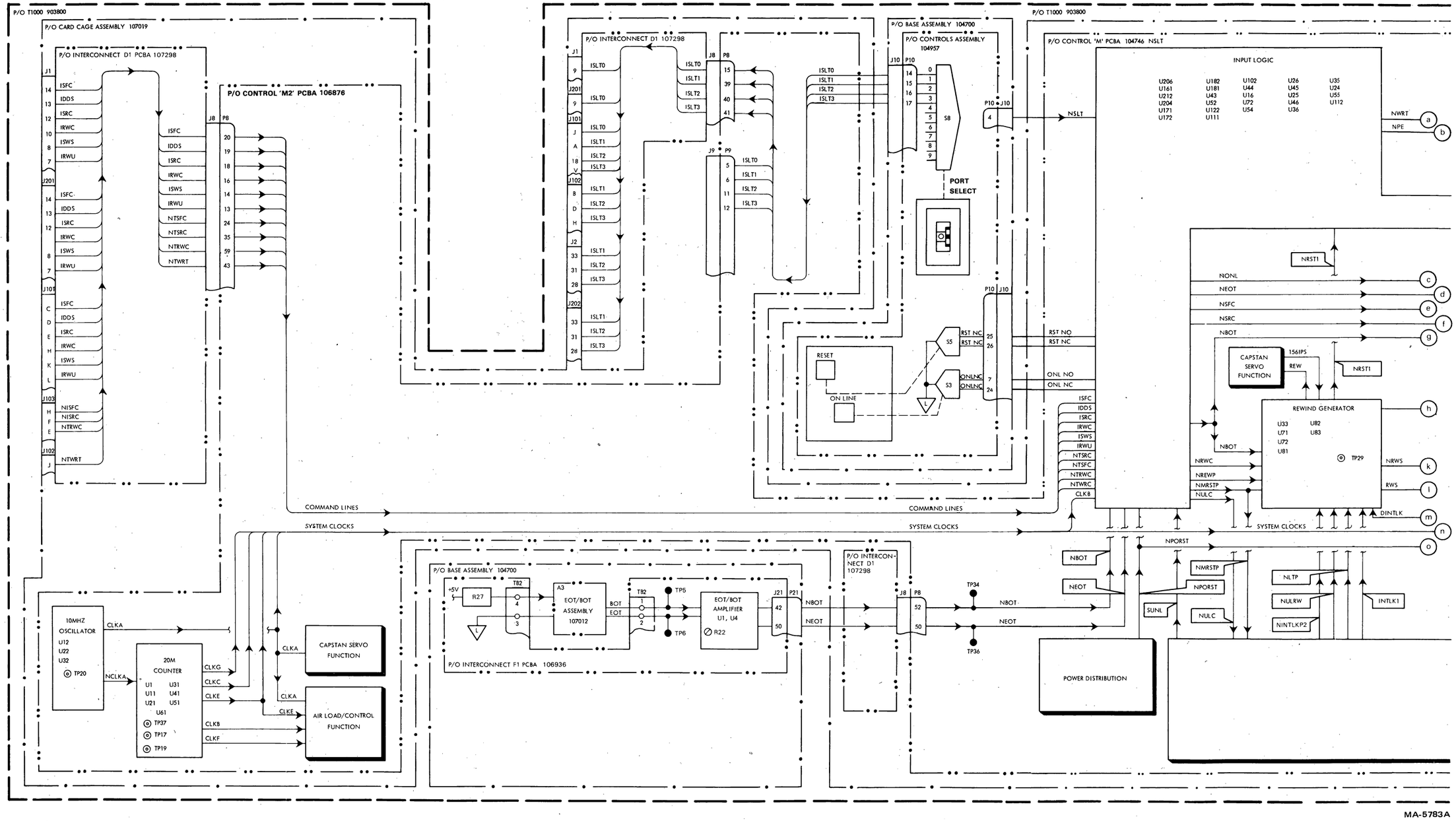
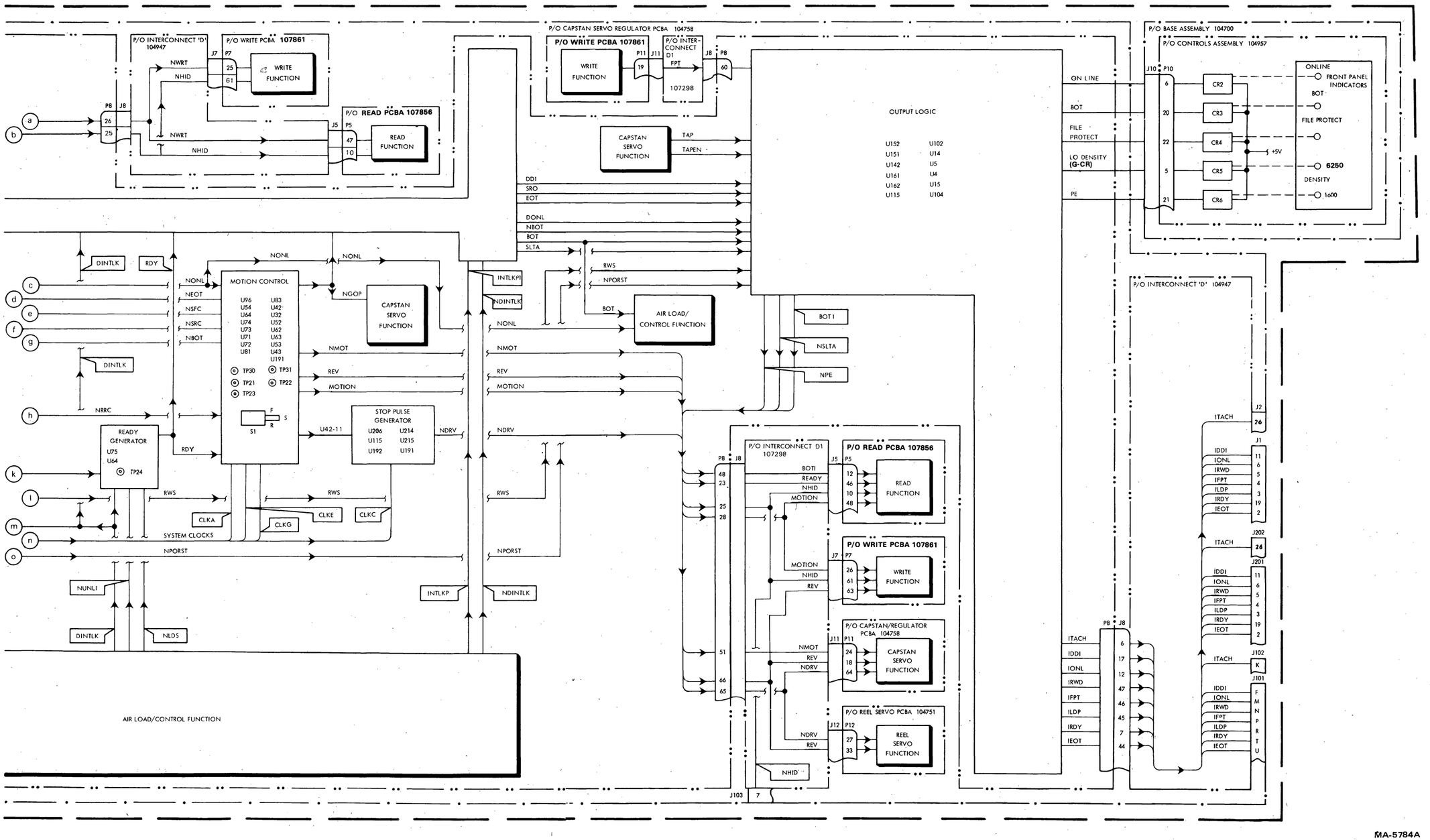


Figure 3 System Control Functional Block Diagram (Sheet 1 of 2)



MA-5784A

Figure 3 System Control Functional Block Diagram (Sheet 2 of 2)

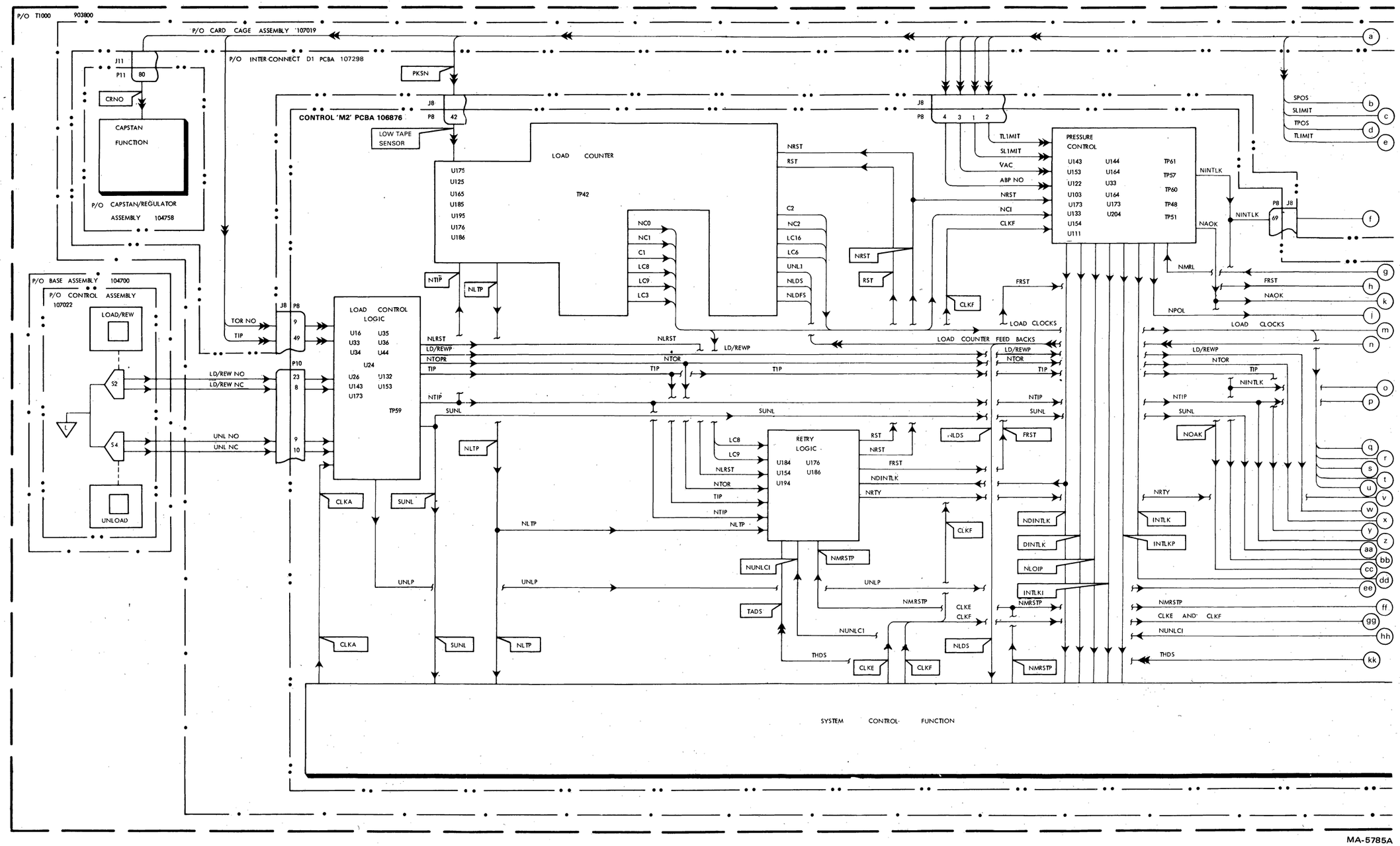


Figure 4 Air Load Control Functional Block Diagram (Sheet 1 of 4)

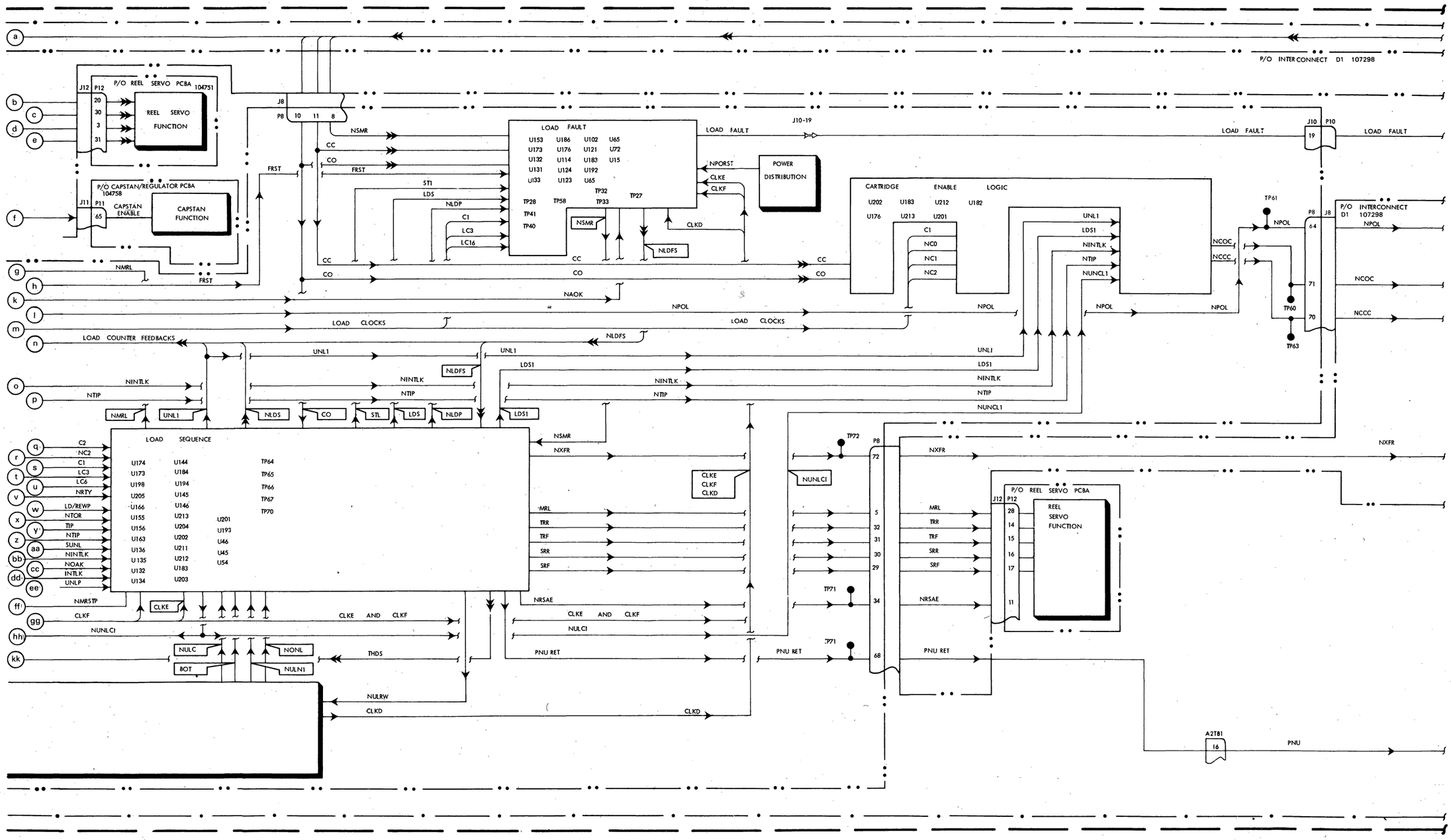
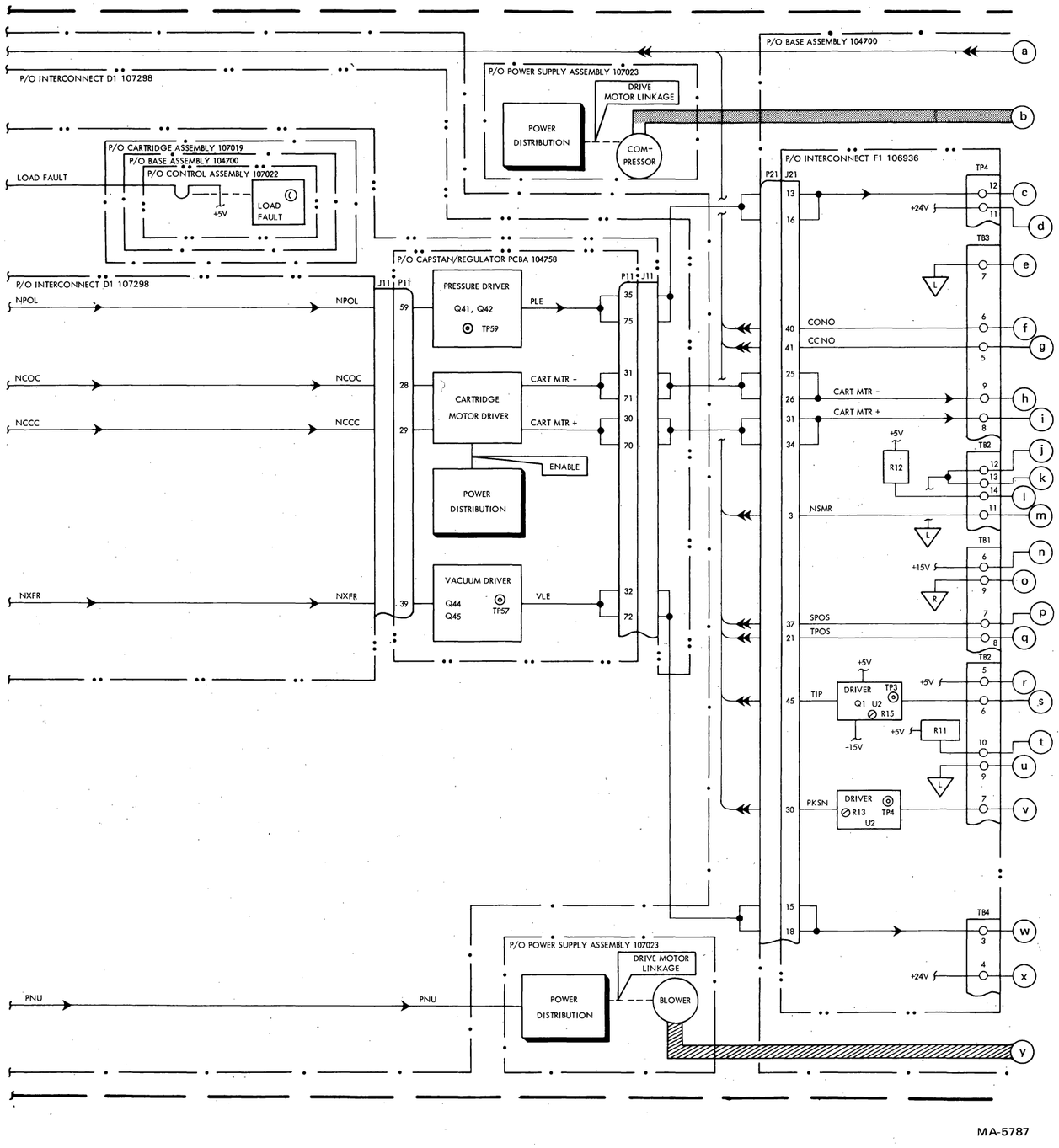


Figure 4 Air Load Control Functional Block Diagram (Sheet 2 of 4)



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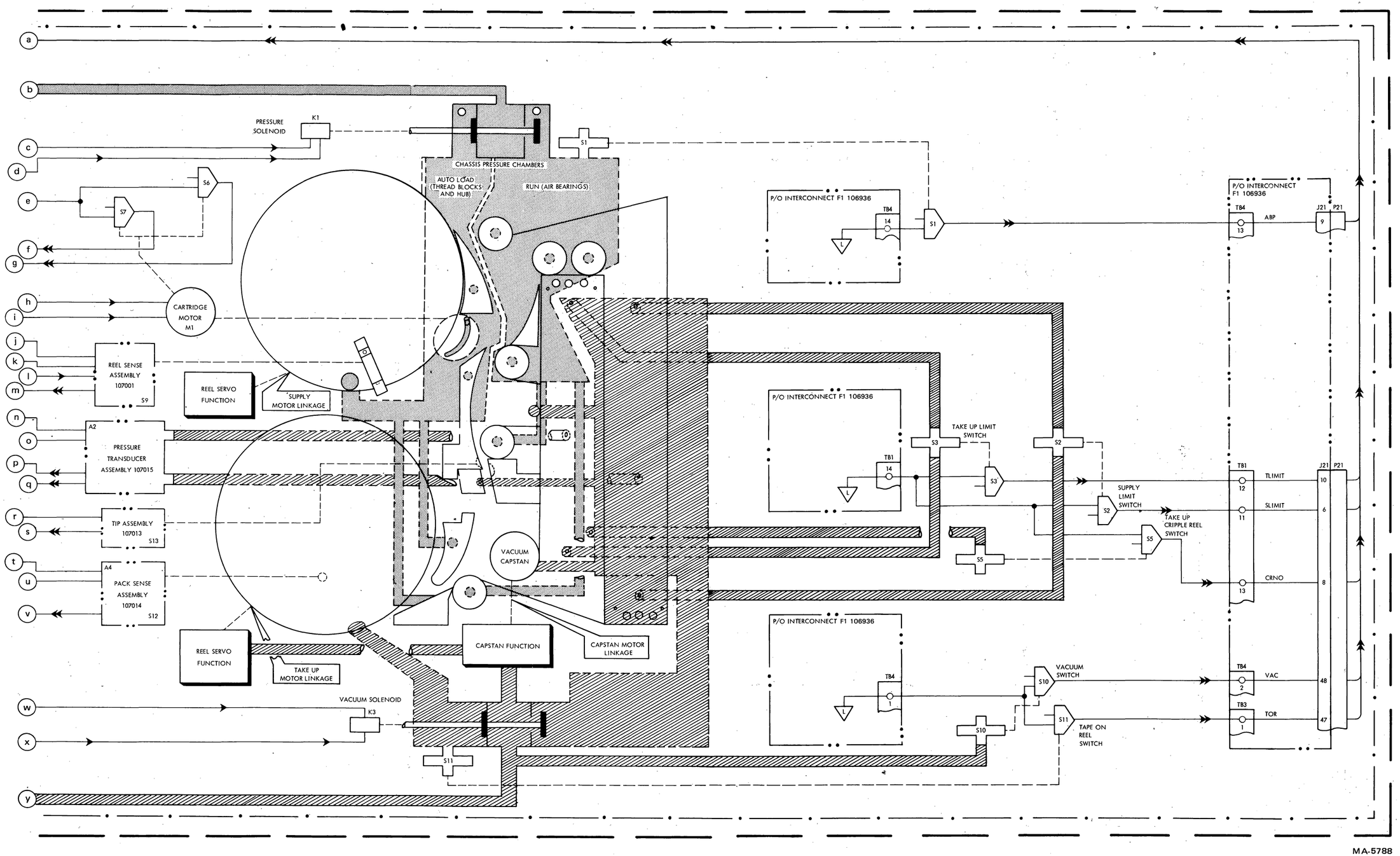


Figure 4 Air Load Control Functional Block Diagram (Sheet 4 of 4)

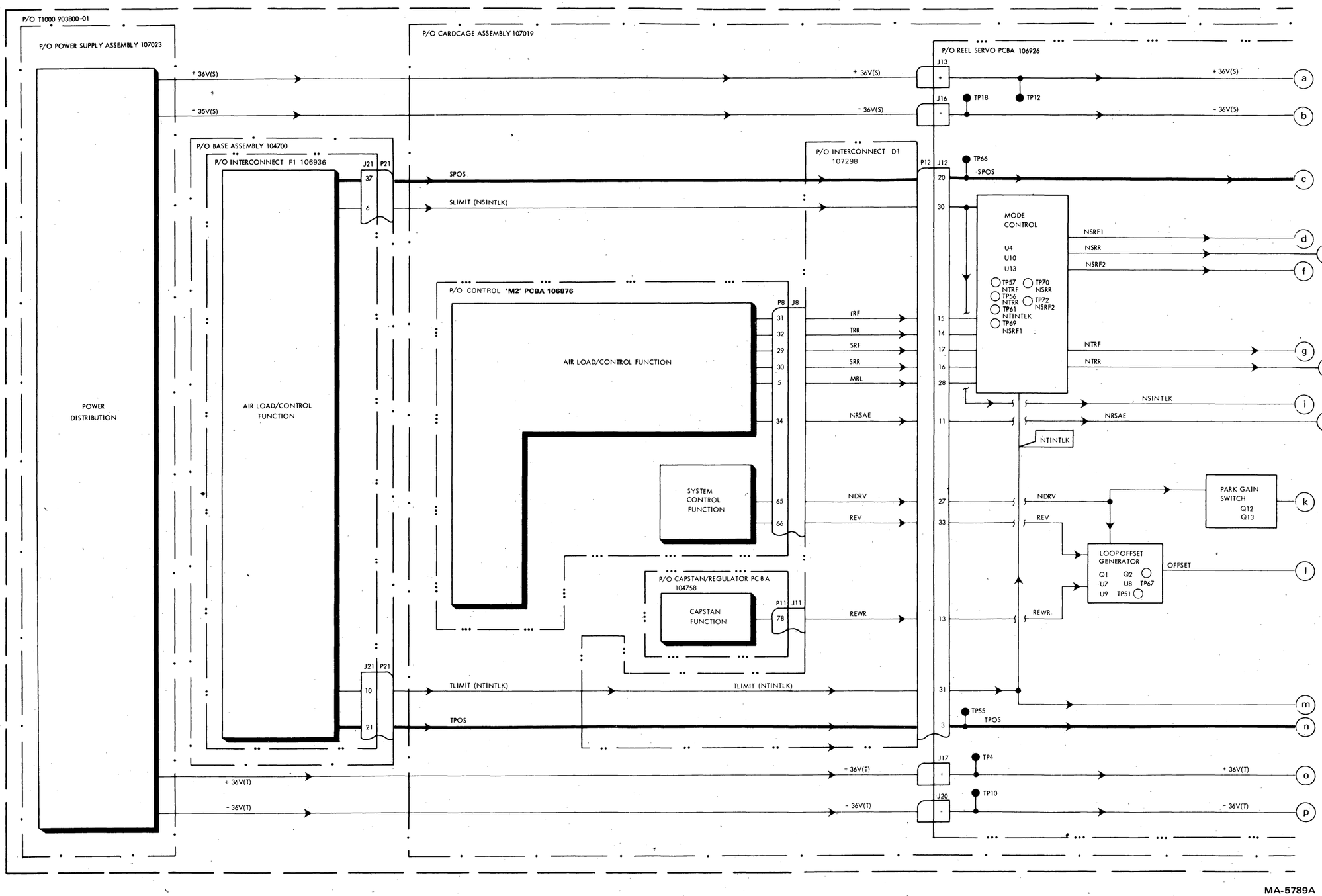


Figure 5 Reel Servo Functional Block Diagram (Sheet 1 of 2)

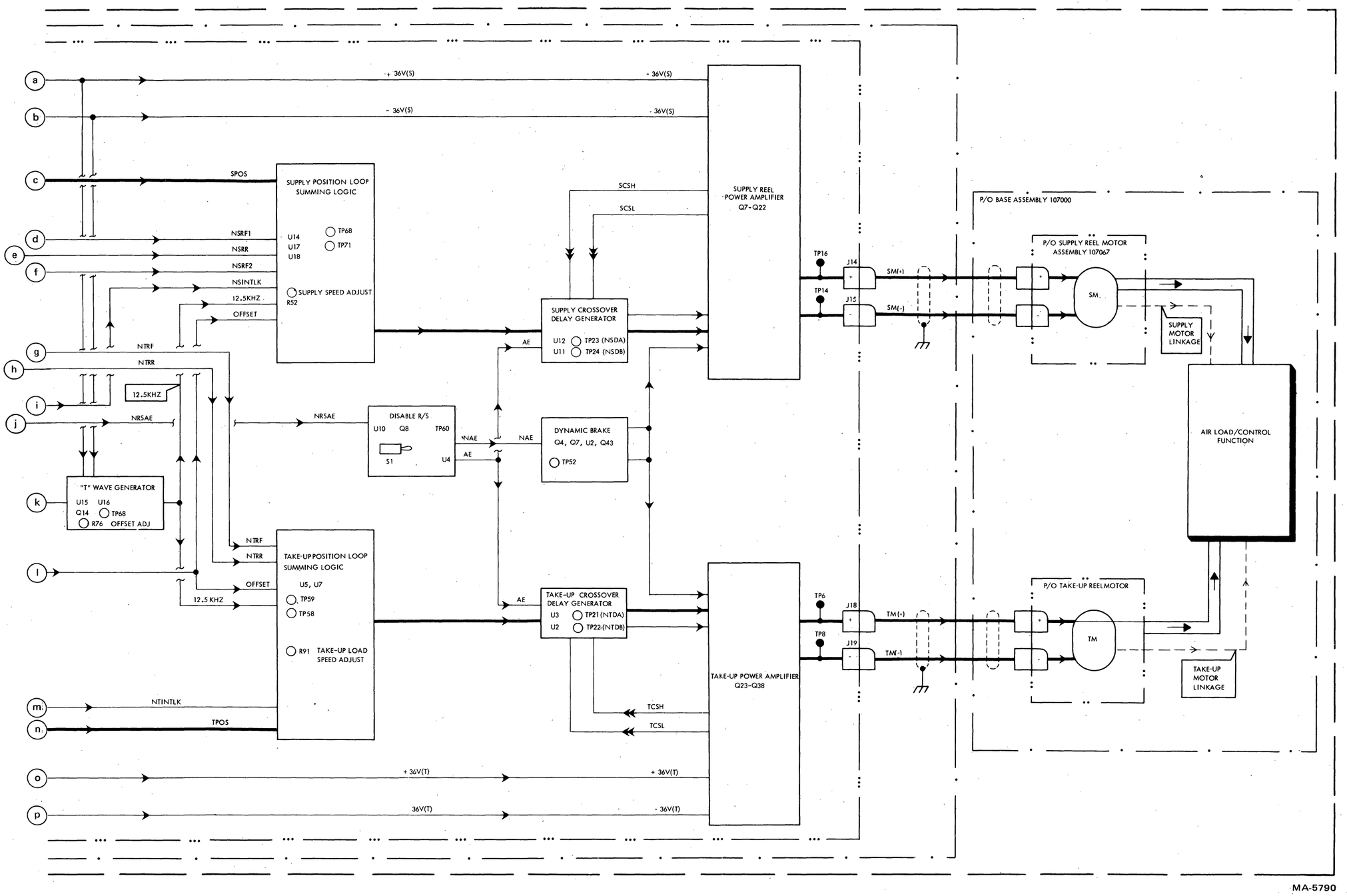


Figure 5 Reel Servo Functional Block Diagram (Sheet 2 of 2)

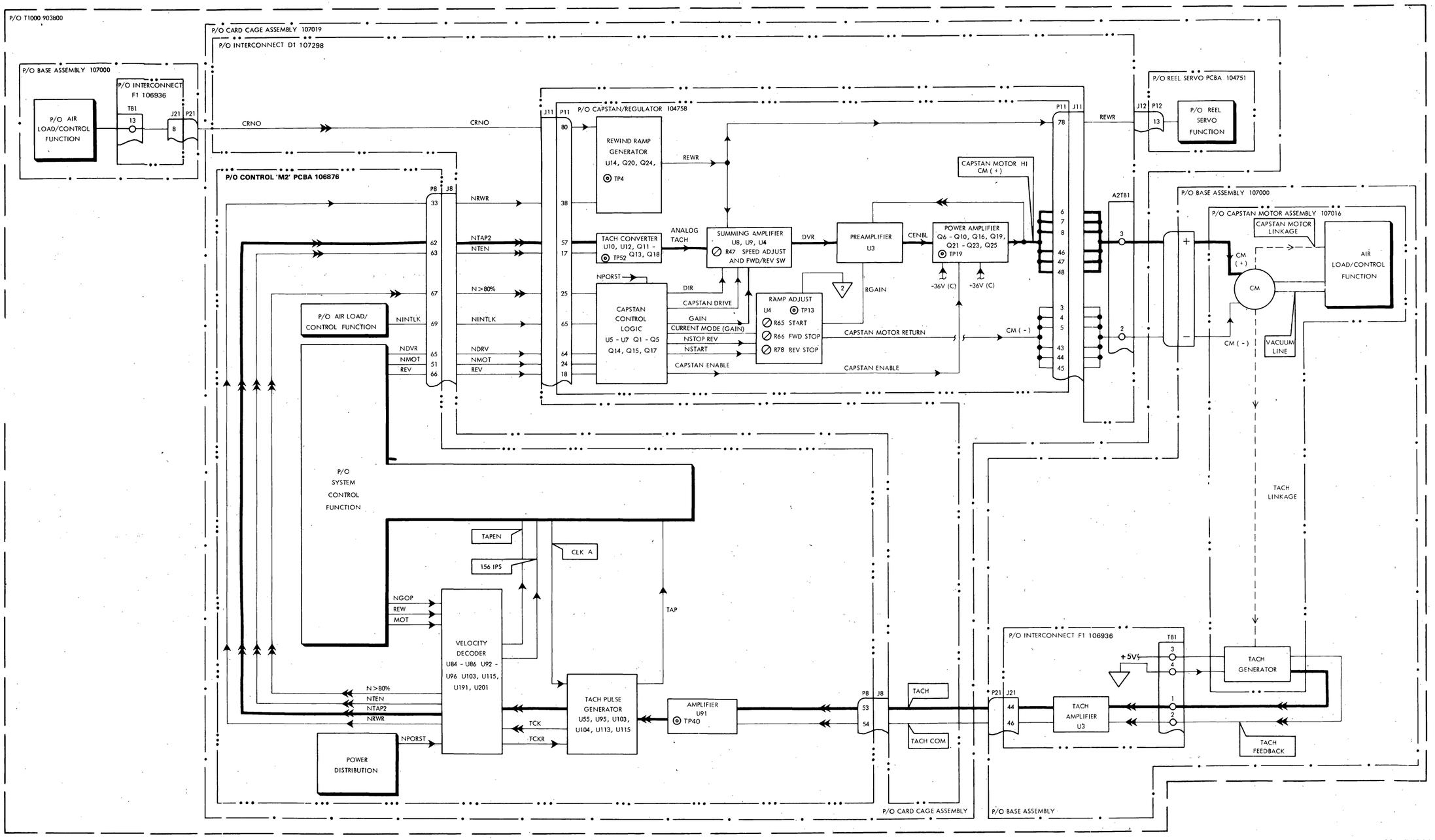


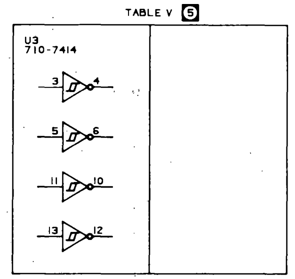
Figure 6 Capstan Servo Functional Block Diagram

REV	DESCRIPTION	DATE	DR	CHK	APPR
A	ERN 10-KZ PROD RELEASE	[illegible]	J.S.	[illegible]	[illegible]
B	ECN 11151	[illegible]	[illegible]	[illegible]	[illegible]
C	ECN 11251	[illegible]	RAS	P.J.	[illegible]
D	ECN 11818	8/2/78	SOL	[illegible]	[illegible]
E	ECN 12070	[illegible]	HM	[illegible]	[illegible]
E1	ECN C12190	[illegible]	HM	[illegible]	[illegible]
E2	ECN C 12489	[illegible]	L.R	[illegible]	[illegible]
F	ECN C13313A	[illegible]	MP	[illegible]	[illegible]
G	ECN C13697	[illegible]	SOL	[illegible]	[illegible]
H	ECN 14362	[illegible]	SRC	[illegible]	[illegible]
J	ECN C14440	4/25/80	SOL	[illegible]	[illegible]
K	ECN C14772	[illegible]	[illegible]	[illegible]	[illegible]
L	ECN C14987	5/8/80	M.A	[illegible]	[illegible]
M	ECN C 13473	[illegible]	I.S.	[illegible]	[illegible]
N	ECN C17122	[illegible]	I.S.	[illegible]	[illegible]
N1	ECN C17470	4/2/81	PRO	[illegible]	[illegible]
N2	ECN C17564	[illegible]	PRO	[illegible]	[illegible]

TABLE I ①

PART NO.	REFERENCE DESIGNATION
100-0005	W2, 3
100-1025	R20
100-1055	R21, 26
100-2245	R25
100-3335	R18
100-4725	R19, 24
100-4745	R23
101-1015	R29
101-4705	R28
101-5615	R27
107-0348	R7, 14
107-1000	R4, 6, 12, 15
107-3833	R10
107-1003	R3, 5, 11, 13
107-5112	R8, 16
107-8253	R2
121-1020	R1, 9
121-1030	R17
121-5040	R22
135-1002	C5, 6
130-1005	C1
135-4742	C2
139-2244	C3, 4
200-4123	Q1
300-4002	CR10, 11, 12
300-4446	CR1 THRU 9
400-0318	U5
400-0307	U1, 2
400-0311	U4, 6
710-7414	U3

TABLE V ⑤



REFERENCE DESIGNATION		
LAST USED	NOT USED	DELETED
C6		
CR12		
J21		
Q1		
R31		
TB4		
TP7		
U6		
W5		W1
S15	S4, 9, 12, 13	

TABLE II

ASSEMBLY 106936 VERSION NO.	VERSION CHARACTERISTIC			R30, 31	
				VALUE	PART NO.
-01				200K	121-2041
-02					
-03				200K	121-2041

TABLE IV ④

I.C. TYPE	GND	+5V	+15V	-15V
LM 307			7	4
LM 311			8	4
LM 318			7	4
74LS14	7	14		

11. WIRE IS 24 AWG WHITE.
10. DIODES ARE IN4446.
9. (RESERVED)
8. (RESERVED)
7. CAPACITOR VALUES ARE IN MICROFARADS, ±20%.
6. RESISTOR VALUES ARE IN OHMS, 1/4W, 5%.

⑤ FOR SPARE LOGIC ELEMENTS, SEE TABLE V.

④ FOR I.C. GENERIC TYPE NUMBER AND GROUND/VOLTAGE PIN NUMBERS SEE TABLE IV.

3. (RESERVED)

② FOR VALUE, PART NUMBER, AND USAGE, OF COMPONENTS AFFECTED BY VERSION NUMBER, SEE TABLE II.

① FOR PART NUMBER OF COMPONENTS NOT AFFECTED BY VERSION NUMBER, SEE TABLE I.

NOTES: UNLESS OTHERWISE SPECIFIED

ASSEMBLY NO. 107000
WIRE LIST NO. 107007

THIS DRAWING IS UNDER CONFIGURATION CONTROL.

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES:
.XX ±
.XXX ±
ANGULAR ± 1/2°
BREAK ALL SHARP CORNERS APPROX .010

SIGNATURES	DATE
DR. Steve [illegible]	1/31/78
CHK [illegible]	2/7/78
DES	
ENGR S Persson	2/8/78
PROJ. ENGR	

PERTEC
a division of Pertec Computer Corporation

TITLE
SCHEMATIC,
BASE ASSEMBLY

NEXT ASSY	1ST USED ON
	T1000

APPLICATION

FINISH:

MATL:

SIZE E | CODE IDENT NO. 32097 | DWG NO. 107307 | REV N_2
SCALE NONE | DO NOT SCALE DWG | SHEET 1 OF 3

CADDS

MA-8555

Figure 7 Schematic, Base Assembly (Sheet 1 of 3)

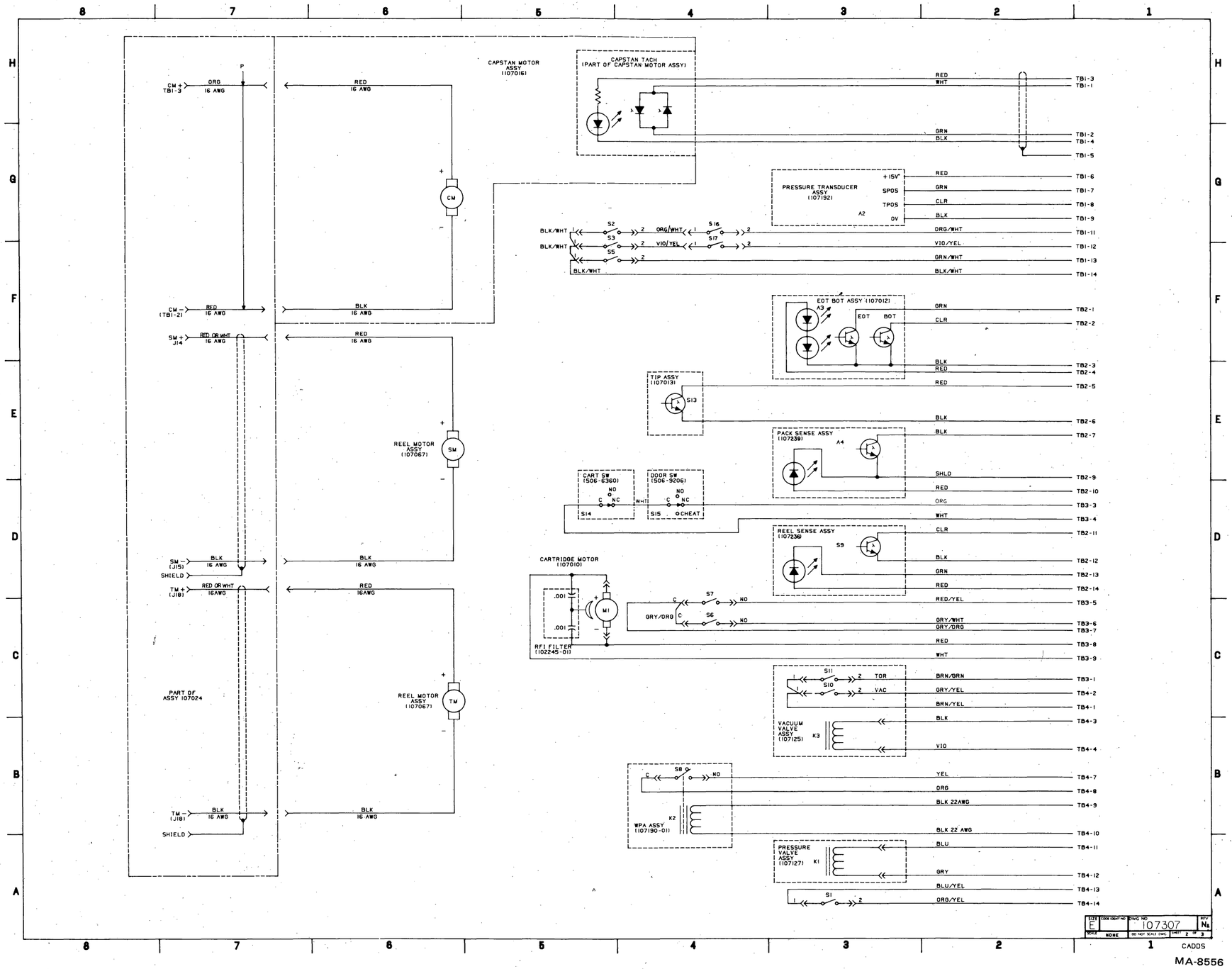
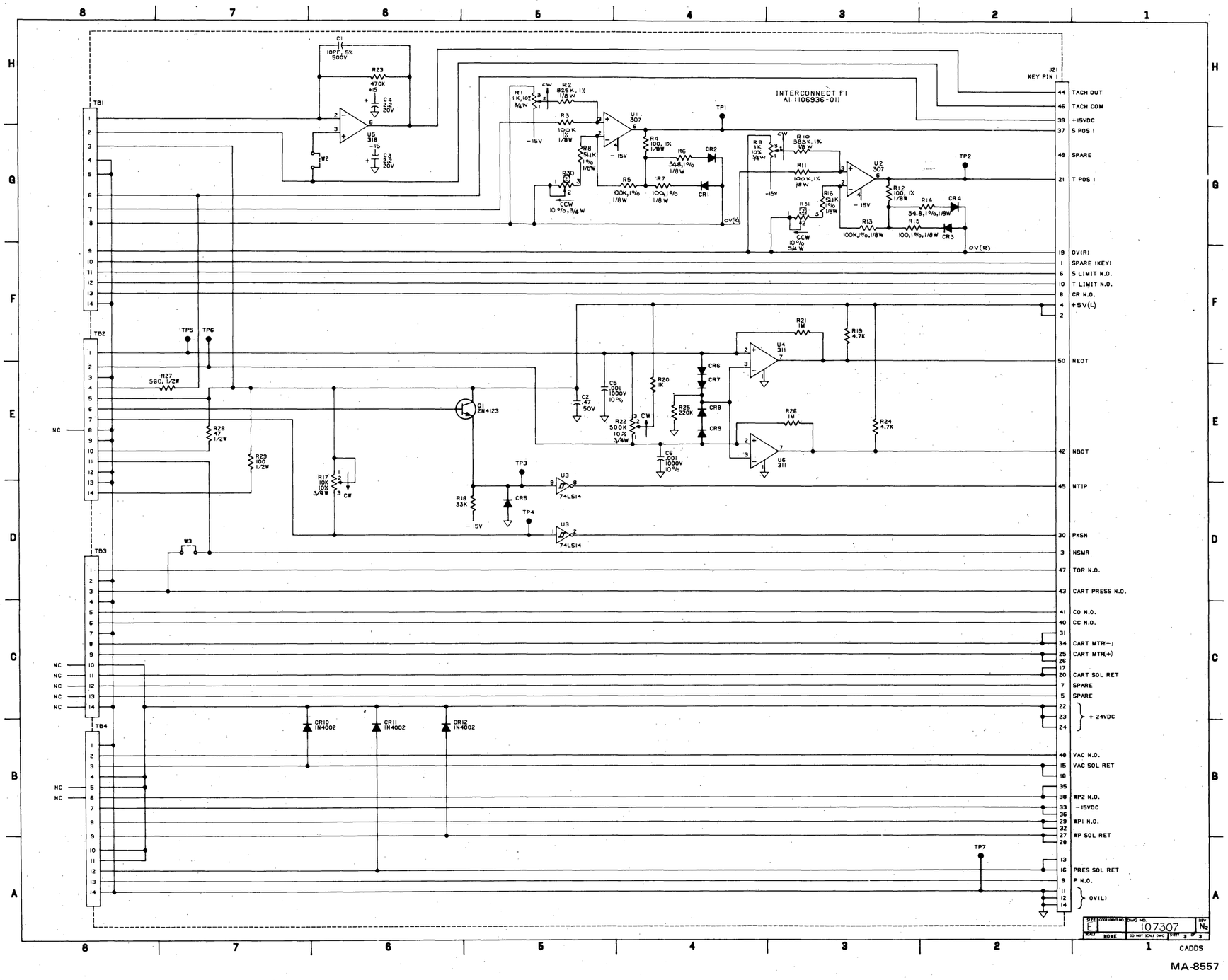
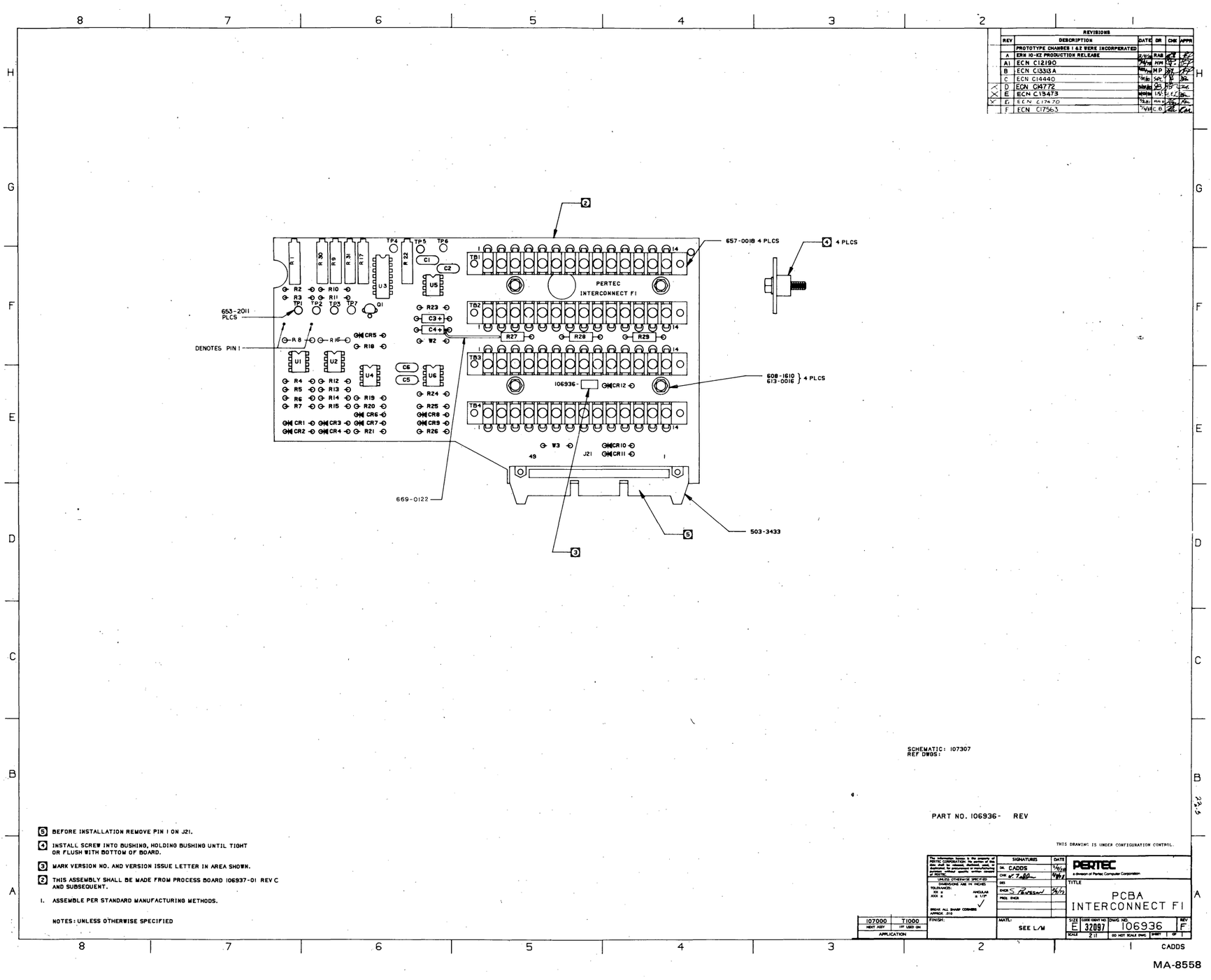


Figure 7 Schematic, Base Assembly (Sheet 2 of 3)



MA-8557

Figure 7 Schematic, Base Assembly (Sheet 3 of 3)



5 BEFORE INSTALLATION REMOVE PIN 1 ON J21.

4 INSTALL SCREW INTO BUSHING, HOLDING BUSHING UNTIL TIGHT OR FLUSH WITH BOTTOM OF BOARD.

3 MARK VERSION NO. AND VERSION ISSUE LETTER IN AREA SHOWN.

2 THIS ASSEMBLY SHALL BE MADE FROM PROCESS BOARD 106937-01 REV C AND SUBSEQUENT.

1. ASSEMBLE PER STANDARD MANUFACTURING METHODS.

NOTES: UNLESS OTHERWISE SPECIFIED

Figure 8 PCBA, Interconnect F1

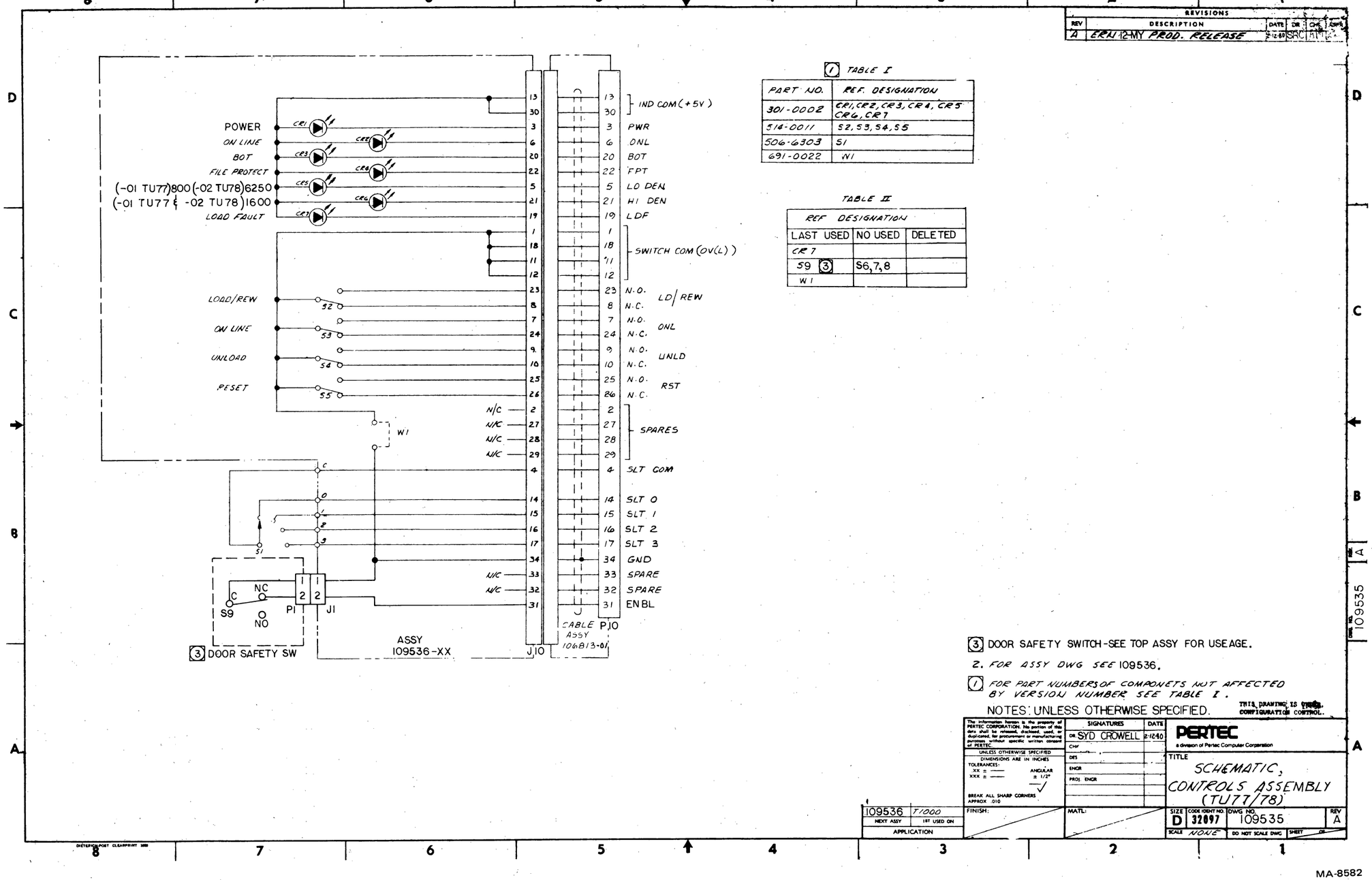
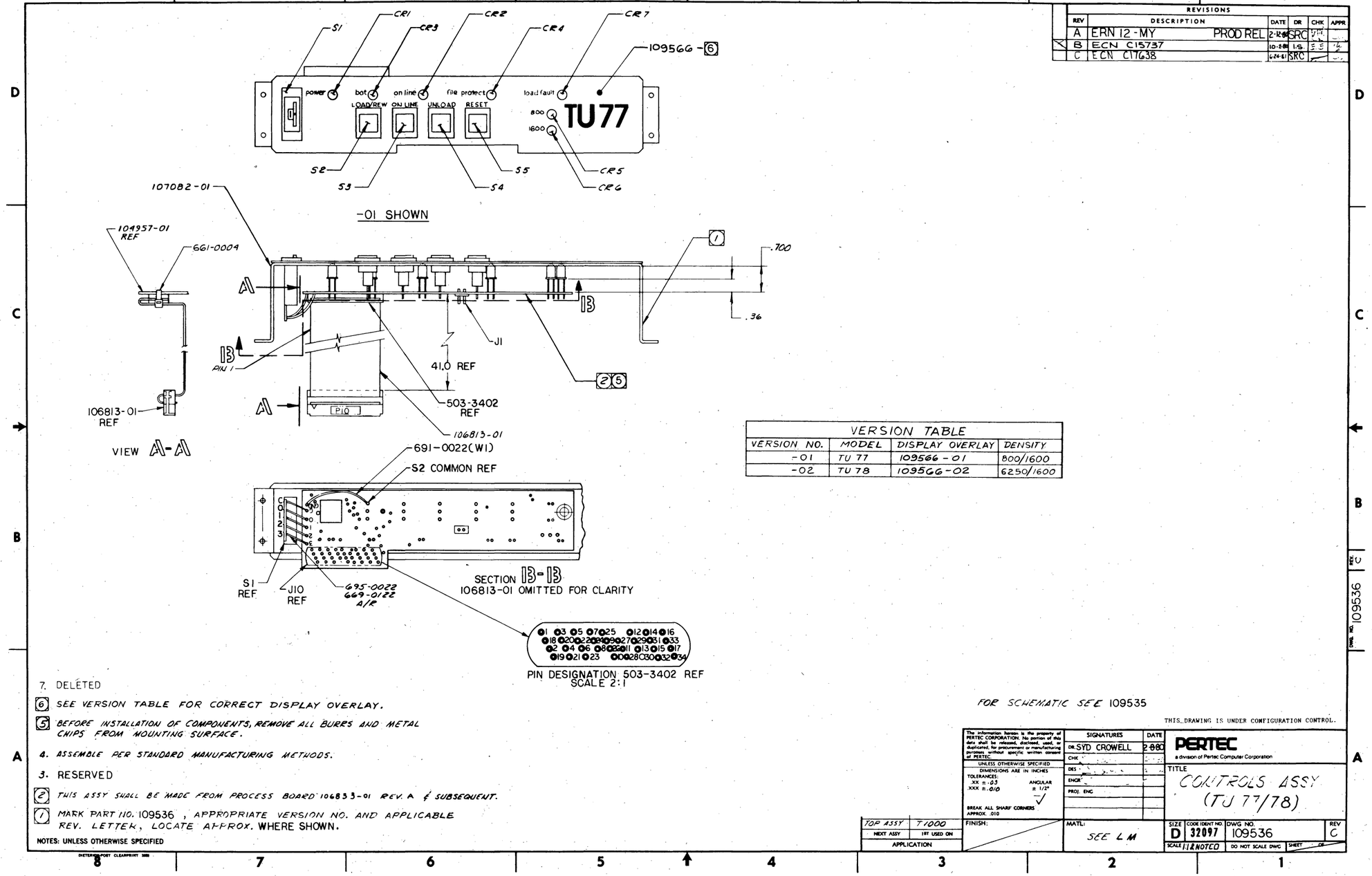


Figure 9 Schematic, Controls Assembly



REVISIONS					
REV	DESCRIPTION	DATE	DR	CHK	APPR
A	ERN 12-MY PROD REL	2-[illegible]	SRC	[illegible]	
B	ECN C15737	10-[illegible]	L.S.	[illegible]	
C	ECN C17638	6-24-81	SRC		

VERSION TABLE			
VERSION NO.	MODEL	DISPLAY OVERLAY	DENSITY
-01	TU 77	109566-01	800/1600
-02	TU 78	109566-02	6250/1600

7. DELETED

6. SEE VERSION TABLE FOR CORRECT DISPLAY OVERLAY.

5. BEFORE INSTALLATION OF COMPONENTS, REMOVE ALL BURRS AND METAL CHIPS FROM MOUNTING SURFACE.

4. ASSEMBLE PER STANDARD MANUFACTURING METHODS.

3. RESERVED

2. THIS ASSY SHALL BE MADE FROM PROCESS BOARD 106833-01 REV. A & SUBSEQUENT.

1. MARK PART NO. 109536, APPROPRIATE VERSION NO. AND APPLICABLE REV. LETTER, LOCATE APPROX. WHERE SHOWN.

NOTES: UNLESS OTHERWISE SPECIFIED

FOR SCHEMATIC SEE 109535

THIS DRAWING IS UNDER CONFIGURATION CONTROL.

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES:
.XX ± .03 ANGULAR
.XXX ± .010 ± 1/2°
BREAK ALL SHARP CORNERS APPROX. .010

SIGNATURES	DATE
DR. SYD CROWELL	2-[illegible]
CHK	
DES	
ENGR	
PROJ. ENG	

PERTEC
a division of Pertec Computer Corporation

TITLE: CONTROLS ASSY (TU 77/78)

TOP ASSY	T1000
NEXT ASSY	1ST USED ON
APPLICATION	

FINISH:

MATL: SEE L M

SIZE	CODE IDENT NO.	DWG NO.	REV
D	32097	109536	C

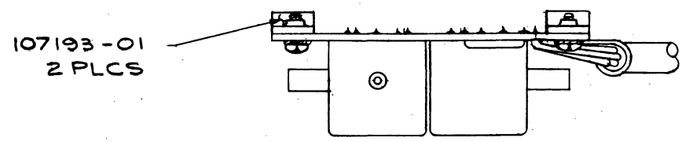
SCALE 1:1 UNLESS NOTED — DO NOT SCALE DWG — SHEET [illegible] OF [illegible]

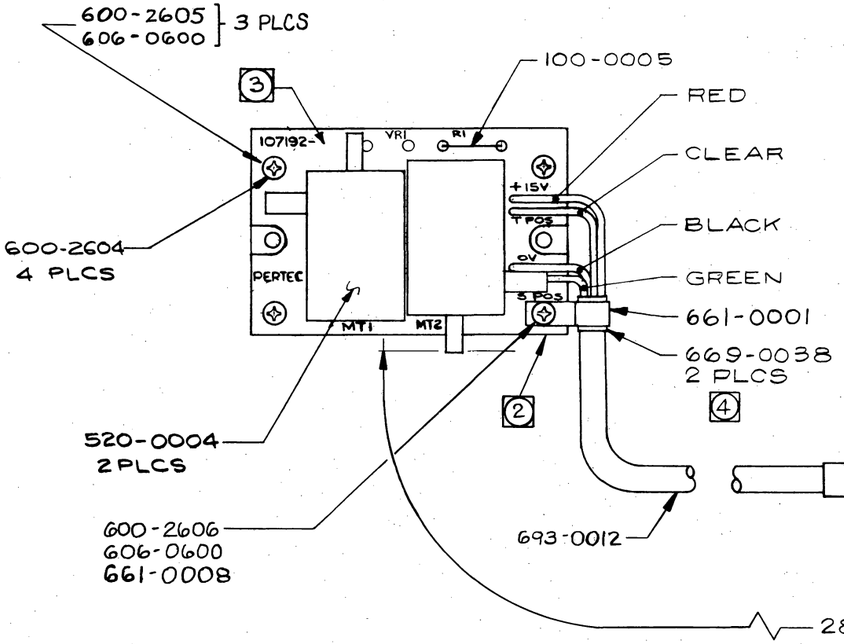
DWG NO. 109536 REV C

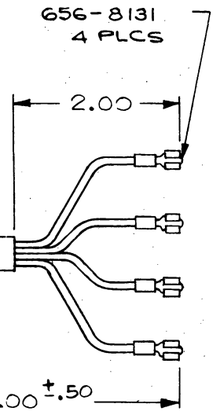
MA-8572

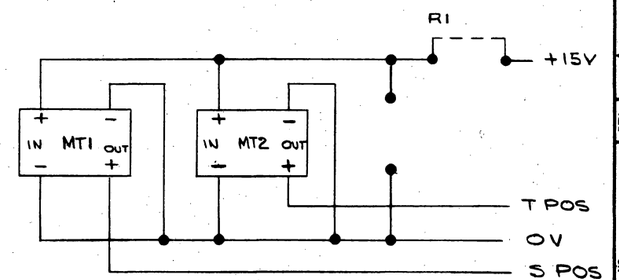
Figure 10 Controls Assembly

REVISIONS					
REV	DESCRIPTION	DATE	DR	CHK	APPR
A	ERN 9FT PRE PROD REL	2/1/77	MW		
B	ECN 9824	4/11/77	RJ		
	ERN 9-PL PROD RELEASE	4/24/77			
C	ECN 10152	6/8/77	SK		
D	ECN 11823	8/2/78	HM		
D1	ECN 12196	10/25/78	DK		









WIRING DIAGRAM

4 TRIM SHIELD AT BOTH ENDS. NO CONNECTION REQD.

3 MARK VERSION NO. AND VERSION ISSUE LETTER IN AREA SHOWN.

2 THIS ASSEMBLY SHALL BE MADE FROM PROCESS BOARD 107194-01 REV A AND SUBSEQUENT.

1. ASSEMBLE PER STANDARD MANUFACTURING METHODS.

NOTES: UNLESS OTHERWISE SPECIFIED

PART NO. 107192 - REV

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES:
.XX ± —
.XXX ± —
ANGULAR ± 1/2°
BREAK ALL SHARP CORNERS APPROX. .010

SIGNATURES	DATE
DR.	1.28.77
CHK	2/1/77
DES	1.28.77
ENGR	2/1/77
PROJ. ENGR	

PERTEC
a division of Pertec Computer Corporation

TITLE
TRANSDUCER
P.C.B.A

107000	T1000
NEXT ASSY	1ST USED ON
APPLICATION	

FINISH:

MATL: SEE L/M

SIZE	CODE IDENT NO.	DWG NO.	REV
C	32097	107192	C
SCALE 1:1	DO NOT SCALE DWG	SHEET 1 OF 1	

DWG NO. 107192 REV. C

DIETZGEN-POST CLEARPRINT 1020

MA-5804

Figure 11 PCBA, Transducer

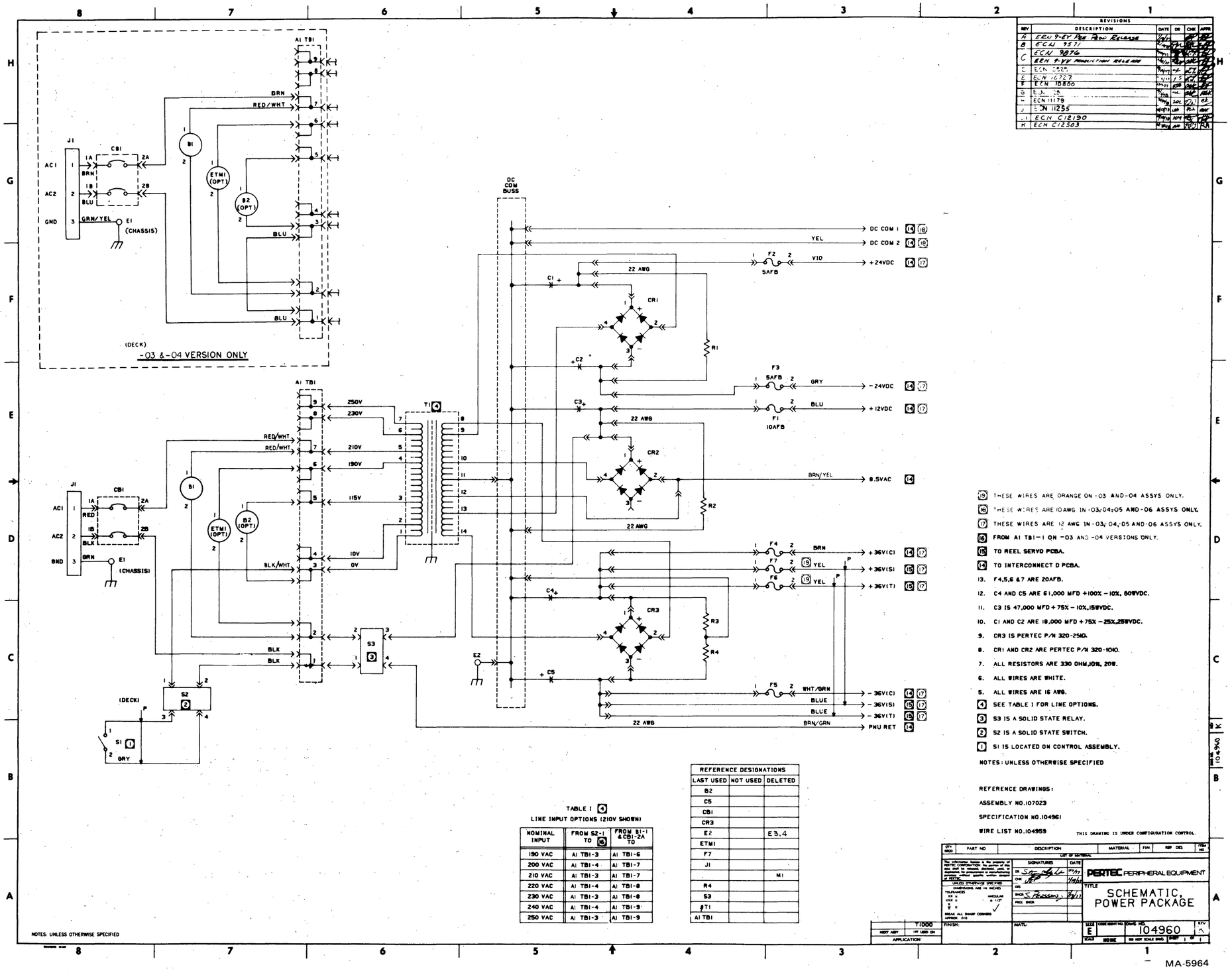


Figure 12 Schematic, Power Package

REV	DESCRIPTION	DATE	DR	CHK	APPR
REVISIONS					
A	ERN 12-KF PRODUCTION RELEASE	[illegible]	CADD	[illegible]	[illegible]
A1	ECN C15020	[illegible]	L.S.	[illegible]	[illegible]
B	ECN C15300	[illegible]	L.S.	[illegible]	[illegible]
C	ECN C15454	[illegible]	SRC	[illegible]	[illegible]
D	ECN C15511A	[illegible]	[illegible]	[illegible]	[illegible]
E	ECN C15675	[illegible]	C.B.		
F	ECN C15831	[illegible]	C.B.		
G	ECN C15976	[illegible]	C.B		
H	ECN C17013	[illegible]	C.B.		
J	ECN C17034	[illegible]	C.B.		
K	ECN C17124	/81			
L	ECN C17125	[illegible]	C.B.		
M	ECN C17143	[illegible]	C.B.		
N	ECN C15948				
P	ECN C17434	4/9/81	RJ		
R	ECN 17679	6-17-81	E.T.		
S	ECN C17778	8-19-81	R.F		

TABLE I [1]

PART NO.	REFERENCE DESIGNATION
100-1015	R5,6,7,8,9,10,11,17,18,19,20
100-1025	R3
100-1035	R16,21
100-1045	R1,4,15
100-2215	R22
100-2225	R14
100-3315	R23
100-4725	R12,13
107-2151	R2
120-0003	U6,96,162,224
130-1015	C27
130-3305	C28
135-1002	C40
135-1031	C1 THRU 26,32,39,41,42,43,48,49,50,51
135-1032	C38
139-2244	C30,31,44,45,46,47
139-2262	C29
300-4446	CR1
330-0475	VR1
400-0318	U91
400-0319	U21
514-0003	S1
524-1000	Y1
700-5452	U4,5,14,15,141,151,161,172,231
710-4132	U136,191
710-4193	U183,235,236
710-7400	U23,24,32,43,45,54,63,65,72,74,103,116,122, 124,132,145,154,156,165,173,175,195,206,213, 214,221,225,233
710-7404	U62,64,104,131,143,193,196,201,204,211
710-7408	U33,155,176
710-7410	U3,46,56,71,75,83,113,115,133,192,194,202,222
710-7414	U42,44,102,163,232
710-7420	U66,73,223
710-7430	U105,126
710-7437	U13,142
710-7440	U164,203
710-7442	U205
710-7474	U12,16,25,26,34,35,52,53,61,81,82,92,93,94, 95,121,125,134,135,144,146,166,174,182,184, 186,212,216,226,22,111
710-7490	U1,2,11,31,41,51,185
710-7493	U76,84,85,86,101,112,123,215

TABLE VI [8]

OPTION	CODE	OMIT
SELECTABLE	A	W3
PERMANENT STATUS	B	W11
REMOTE DENSITY	C	W4
ON LINE AT BOT	D	W2
REMOTE 7TK/9K	E	W1
EOT LATCH	F	W12

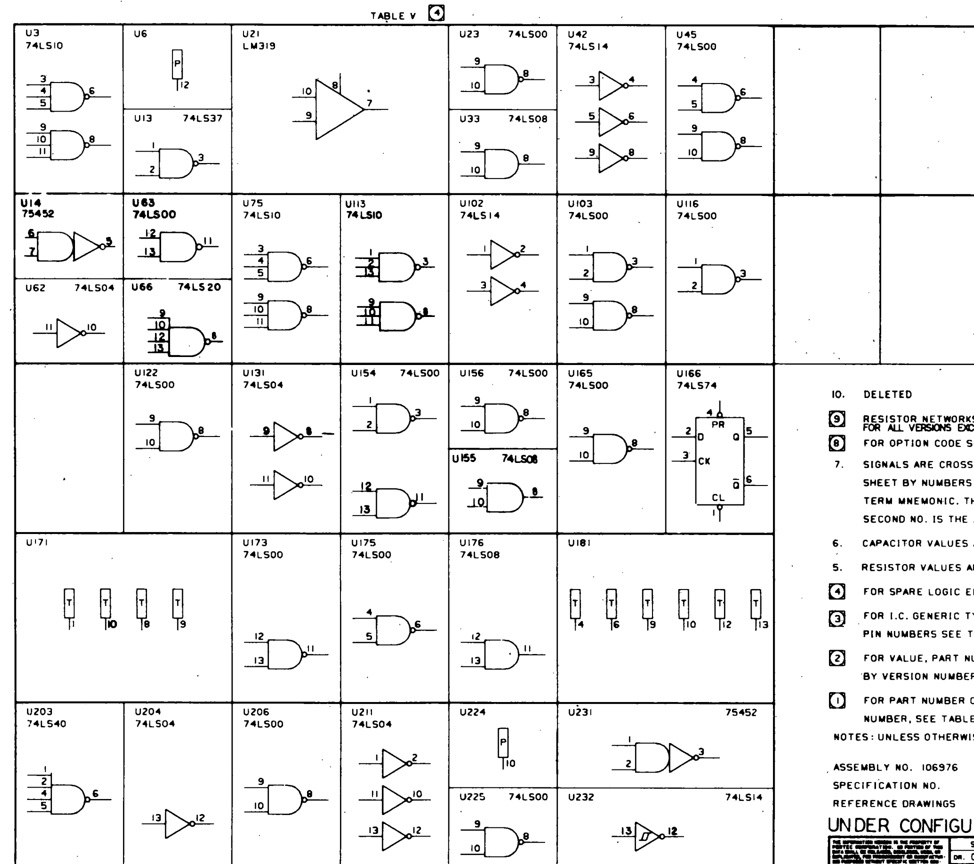
REFERENCE DESIGNATIONS

LAST USED	NOT USED	DELETED
C51		
CR1		
R23		
S1		
TP72	TP4,5,6,7,8,9,10,11,12,	
U236	U7,8,9,10,17,18,19 20, 27,28,29,30,36,37, 38,39,40,47,48,49,50,55,57,58,59,60,67,68, 69,70,77,78,79,80,87,88,89,90,97,98,99,100, 106,107,108,109,110 14,117,118,119,120,127, 128,129,130,137,138,139,140,147,148,149,150, 152,153,157,158,159,160,167,168,169,170,177, 178,179,180,187,188,189,190,197,198,199,200, 207,208,209,210,217,218,219,220,227,228,229, 230, 234	
VR1		
W21		
Y1		

TABLE IV [3]

IC TYPE	+5V(L)	+15V	0V(L)	−15V	0V(I)	+5V(T)
LM318		7		4		
LM319		11		6		
120-0001					7	14
120-0003	14					
74LS00	14		7			
74LS04	14		7			
74LS08	14		7			
74LS10	14		7			
74LS14	14		7			
74LS20	14		7			
74LS30	14		7			
74LS37	14		7			
74LS40	14		7			
74LS42	16		8			
74LS74	14		7			
74LS90	5		10			
74LS93	5		10			
74LS132	14		7			
74LS193	16		8			
75452	8					

TABLE V [4]



10. DELETED

[9] RESISTOR NETWORKS U171 AND U181 (120-0001) ARE SPECIFIED AT TOP ASSY FOR ALL VERSIONS EXCEPT -02 AND -12.

[8] FOR OPTION CODE SEE TABLE VI.

7. SIGNALS ARE CROSS-REFERENCED BETWEEN SHEETS AND WITHIN A SHEET BY NUMBERS APPEARING UNDER THE ASSOCIATED LOGIC TERM MNEMONIC. THE FIRST NO. IS THE SHEET NO. AND THE SECOND NO. IS THE ZONE NO.

6. CAPACITOR VALUES ARE IN MICROFARADS, 20%, 100V.

5. RESISTOR VALUES ARE IN OHMS, 5%, 1/4W.

[4] FOR SPARE LOGIC ELEMENTS SEE TABLE V.

[3] FOR I.C. GENERIC TYPE NUMBER AND GROUND/VOLTAGE PIN NUMBERS SEE TABLE IV.

[2] FOR VALUE, PART NUMBER AND USAGE OF COMPONENTS AFFECTED BY VERSION NUMBER, SEE TABLE II.

[1] FOR PART NUMBER OF COMPONENTS NOT AFFECTED BY VERSION NUMBER, SEE TABLE I.

NOTES: UNLESS OTHERWISE SPECIFIED

ASSEMBLY NO. 106976

SPECIFICATION NO.

REFERENCE DRAWINGS

UNDER CONFIGURATION CONTROL

NEXT ASSY	1ST USED ON
106876	T1000
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES: .XX ± .XXX ± ANGULAR ± 1/2°
BREAK ALL SHARP CORNERS APPROX. .010

FINISH:

MATL:

SIGNATURES: DR. CADD; CHK; DES; ENGR; PROJ. ENGR

PERTEC — A DIVISION OF PERTEC COMPUTER CORPORATION

TITLE: SCHEMATIC, CONTROL M2

SIZE: E | CODE IDENT NO.: 32097 | DWG NO.: 106875 | REV: S

SCALE: NONE | DO NOT SCALE DWG | SHEET 1 OF 12

CAD

MA-8561

Figure 13 Schematic, Control M2 (Sheet 1 of 12)

TABLE II [2]

MODEL	SPD (IPS)	OPTION CODE	ASSEMBLY 106876 VERSION NO.	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14	W15	W16	W17	W18	W19	W20	W21	U171, U181 [9]	C33,34,35,36,37
				503-0138	503-0138	503-0138	503-0138	503-0138	503-0138	503-0138	503-0138	503-0138	503-0138	503-0138	503-0138	503-0138	503-0138	503-0138	503-0138	503-0138	503-0138	503-0138	[illegible]	[illegible]	120-0001	135-1032
STD	125	A	-01	USE	USE	OMIT	USE	OMIT	OMIT	OMIT	OMIT	USE	USE	USE	OMIT	USE	OMIT	OMIT	OMIT	USE	OMIT	USE	OMIT	USE	OMIT	OMIT
STD	125	B,C	-02	USE	USE	USE	OMIT	OMIT	OMIT	OMIT	OMIT	USE	USE	OMIT	OMIT	USE	OMIT	OMIT	OMIT	USE	OMIT	USE	OMIT	USE	USE	USE
STD	125	A,C	-03	USE	USE	OMIT	OMIT	OMIT	OMIT	OMIT	OMIT	USE	USE	USE	OMIT	USE	OMIT	OMIT	OMIT	USE	OMIT	USE	OMIT	USE	OMIT	OMIT
GCR	125	A	-11	USE	USE	OMIT	USE	OMIT	OMIT	OMIT	USE	OMIT	USE	USE	OMIT	USE	USE	OMIT	USE	OMIT	OMIT	USE	OMIT	USE	OMIT	OMIT
GCR	125	B,C	-12	USE	USE	USE	OMIT	USE	OMIT	OMIT	OMIT	USE	USE	OMIT	OMIT	USE	USE	USE	OMIT	OMIT	OMIT	OMIT	USE	OMIT	USE	USE
GCR	125	A,C	-13	USE	USE	OMIT	OMIT	OMIT	OMIT	OMIT	USE	OMIT	USE	USE	OMIT	USE	USE	OMIT	USE	OMIT	OMIT	USE	OMIT	USE	OMIT	OMIT
STD	75	A	-21	USE	USE	OMIT	USE	OMIT	OMIT	USE	USE	OMIT	USE	USE	OMIT	OMIT	OMIT	USE	USE	USE	USE	USE	OMIT	USE	OMIT	OMIT
STD	75	B,C	-22	USE	USE	USE	OMIT	OMIT	OMIT	USE	USE	OMIT	USE	OMIT	OMIT	OMIT	OMIT	USE	USE	USE	USE	USE	OMIT	USE	OMIT	*OMIT
GCR	75	A	-31	USE	USE	OMIT	USE	USE	USE	USE	USE	USE	USE	USE	OMIT	USE	USE	USE	USE	USE	USE	USE	OMIT	USE	OMIT	OMIT
GCR	75	B,C	-32	USE	USE	USE	OMIT	USE	USE	USE	USE	USE	USE	OMIT	OMIT	USE	USE	USE	USE	USE	USE	USE	OMIT	USE	OMIT	OMIT

SIZE E | CODE IDENT NO. 32097 | DWG NO. [illegible] | REV S | SHEET 2 OF 12

MA-8560

Figure 13 Schematic, Control M2 (Sheet 2 of 12)

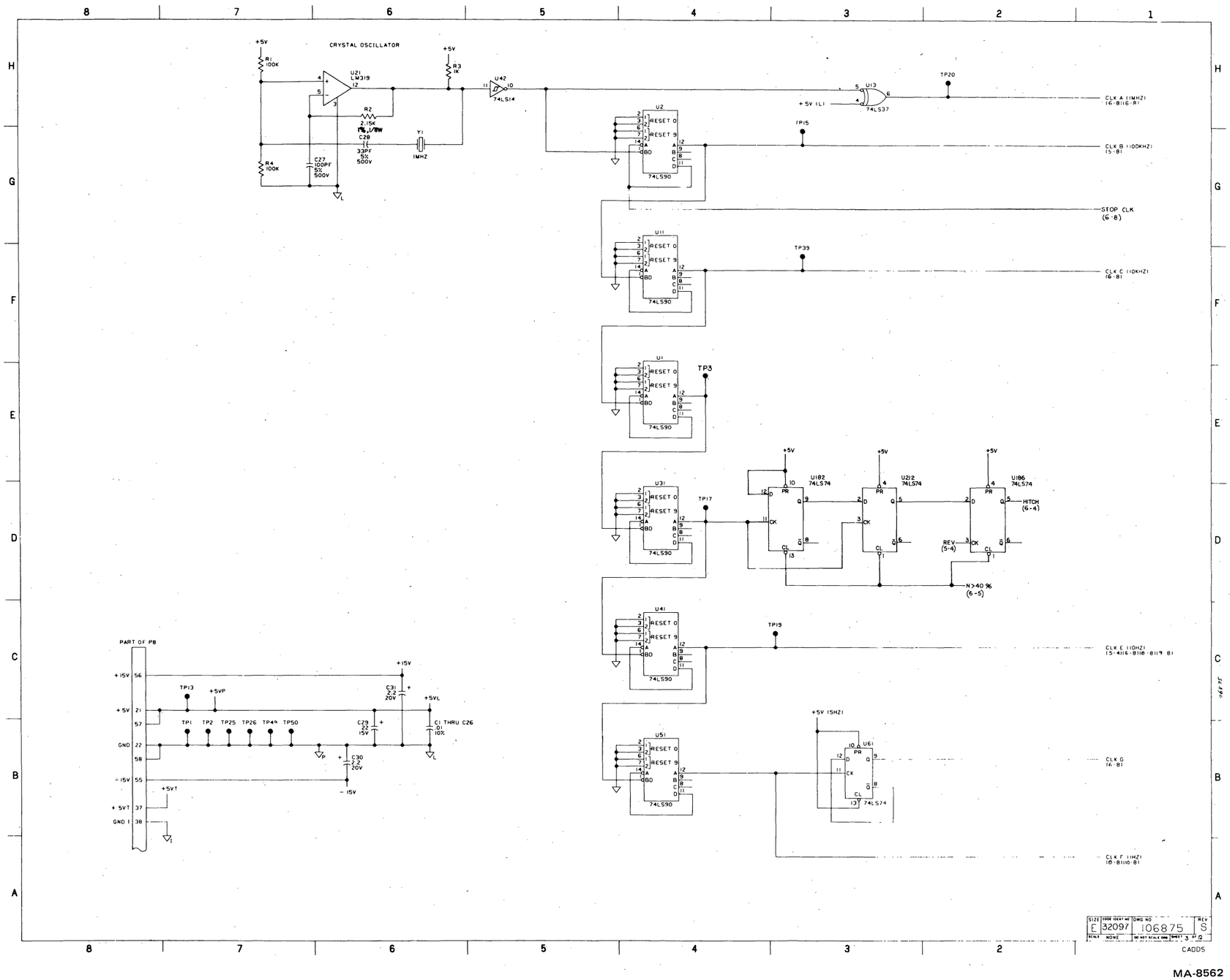


Figure 13 Schematic, Control M2 (Sheet 3 of 12)

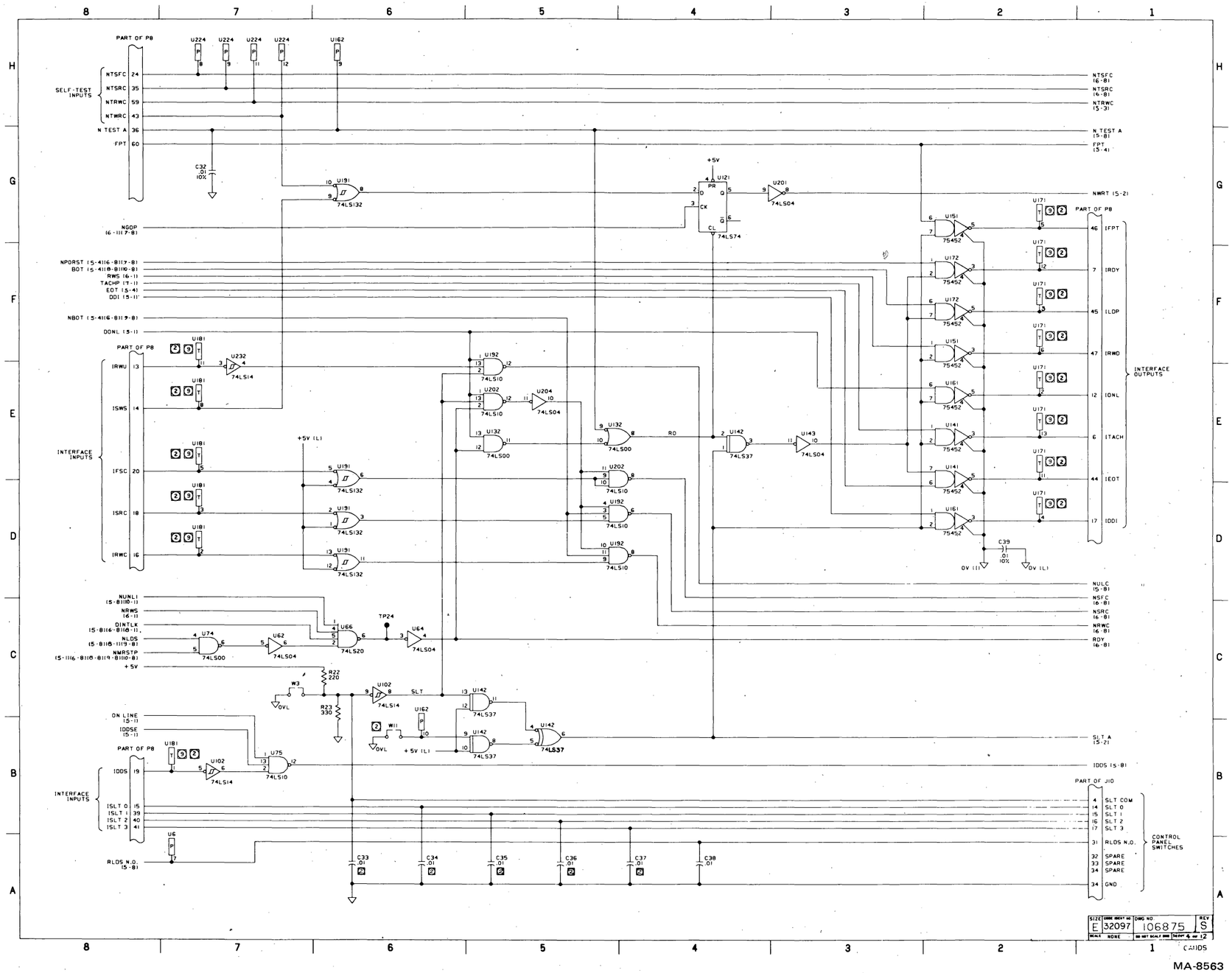


Figure 13 Schematic, Control M2 (Sheet 4 of 12)

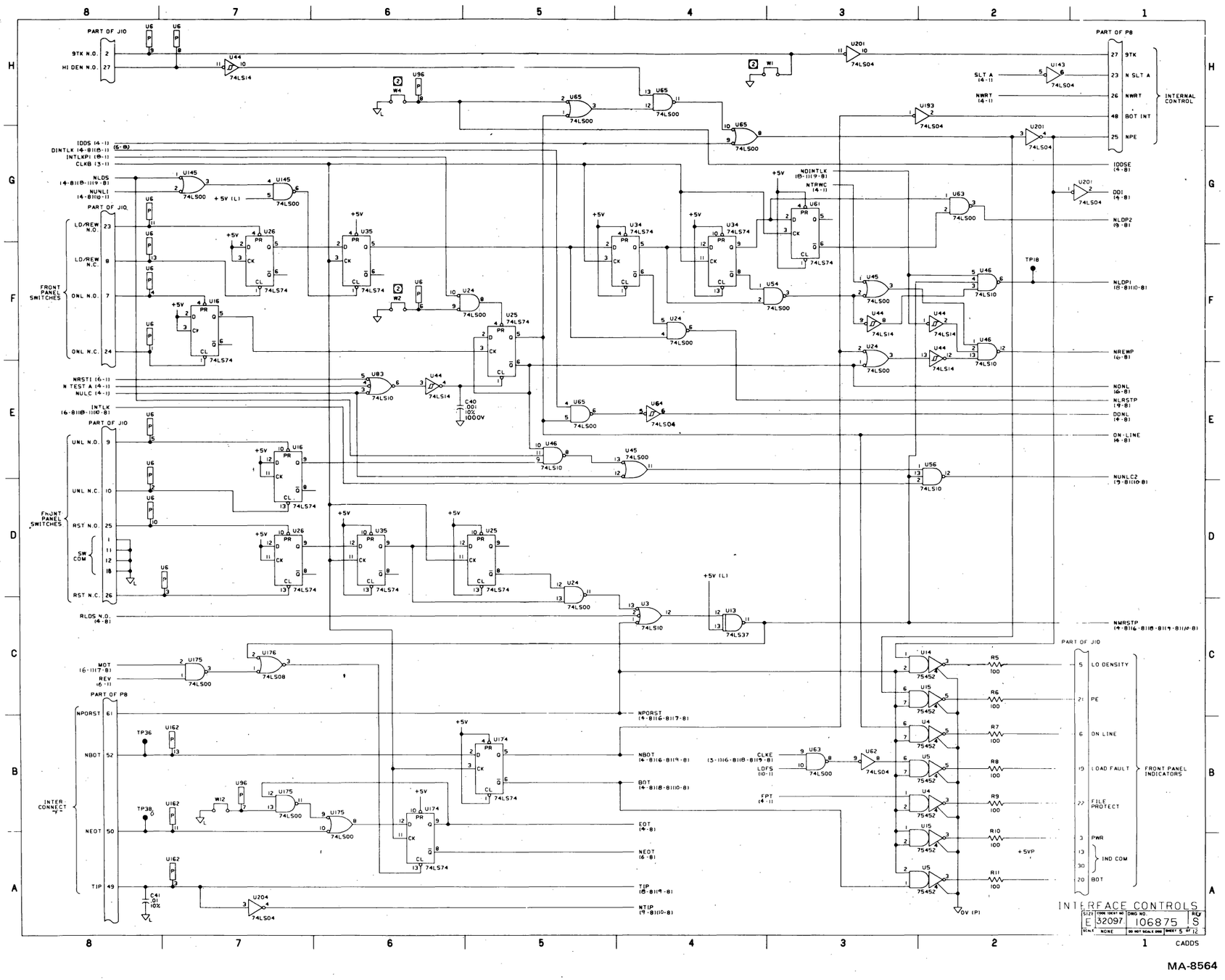


Figure 13 Schematic, Control M2 (Sheet 5 of 12)

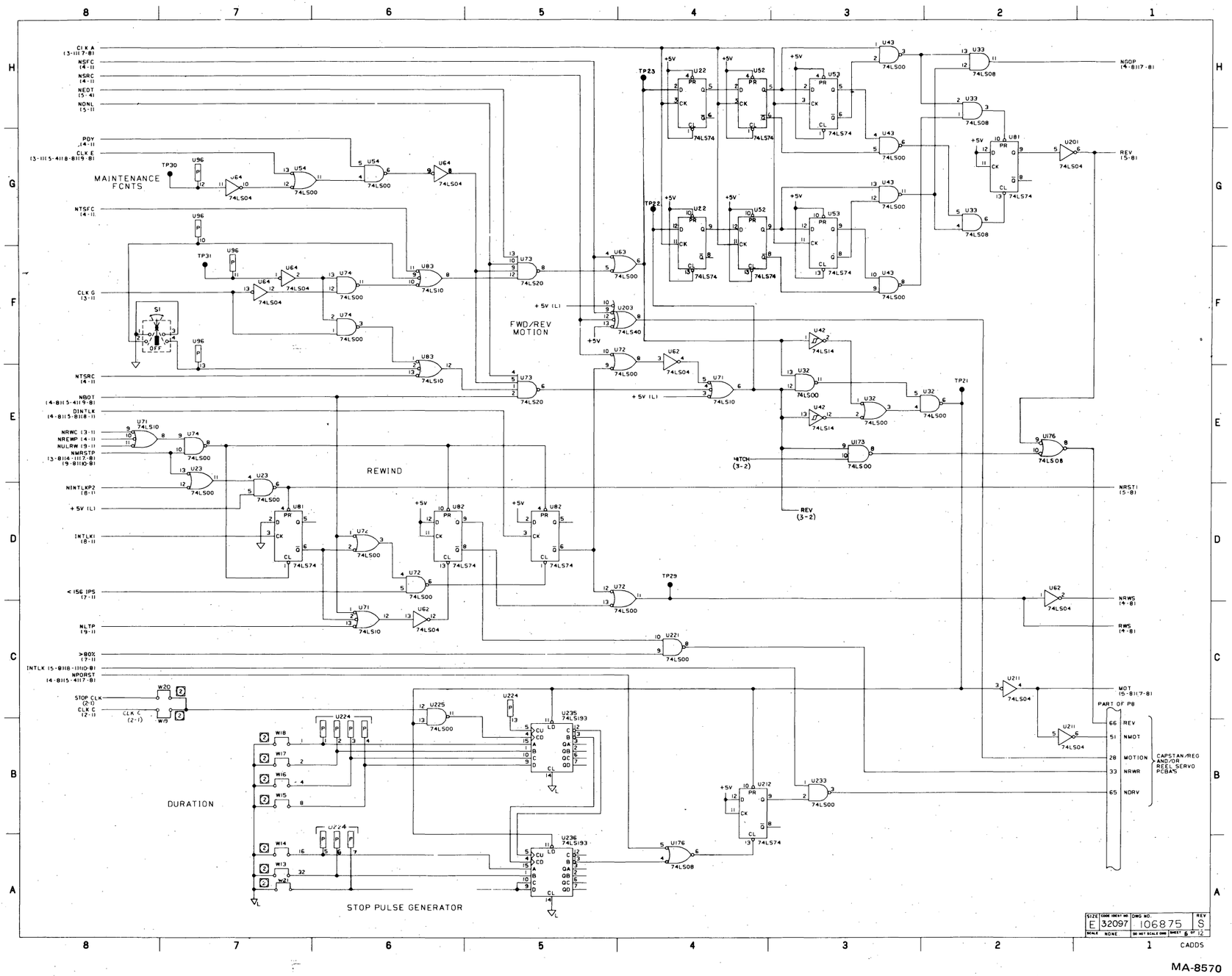


Figure 13 Schematic, Control M2 (Sheet 6 of 12)

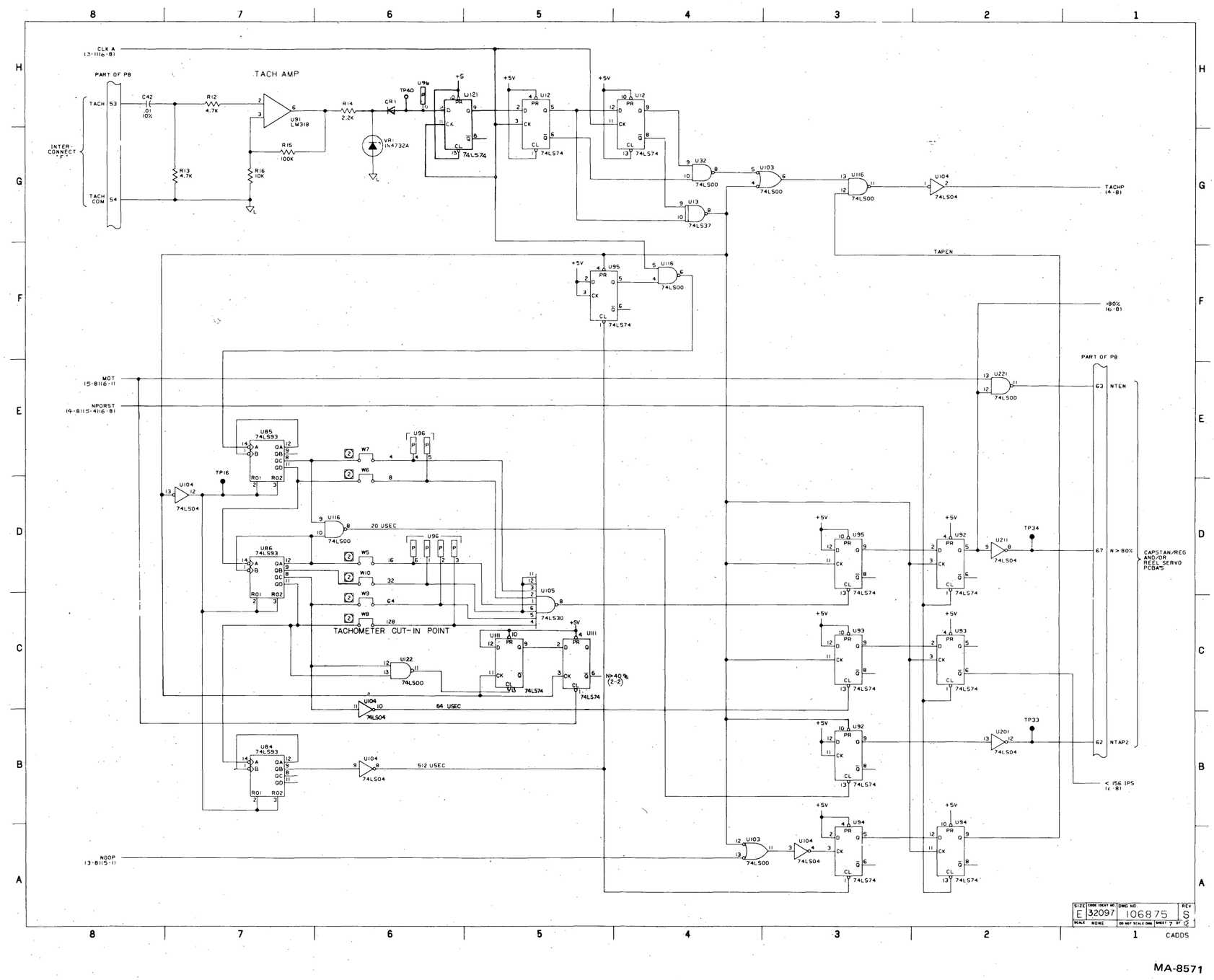


Figure 13 Schematic, Control M2 (Sheet 7 of 12)

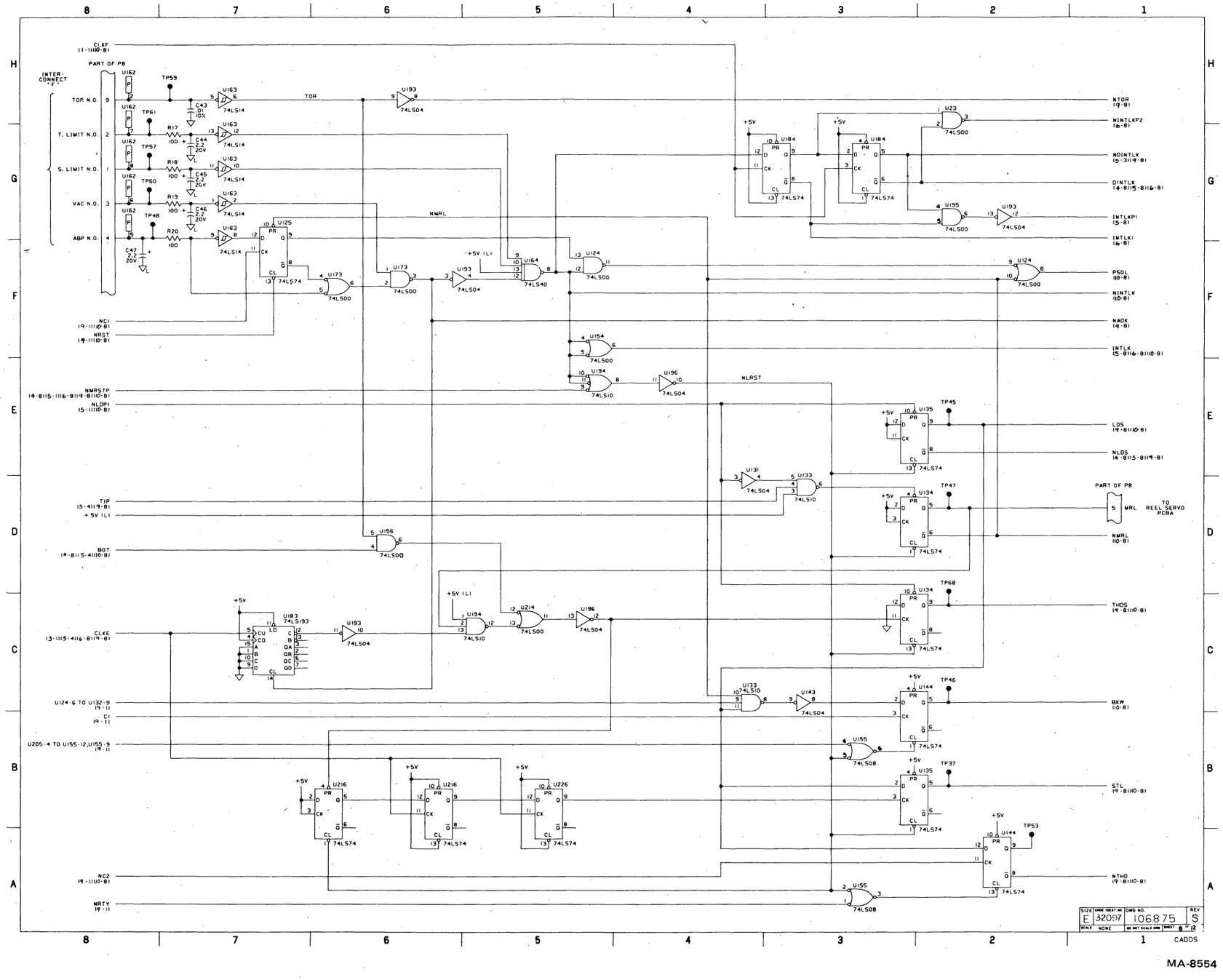


Figure 13 Schematic, Control M2 (Sheet 8 of 12)

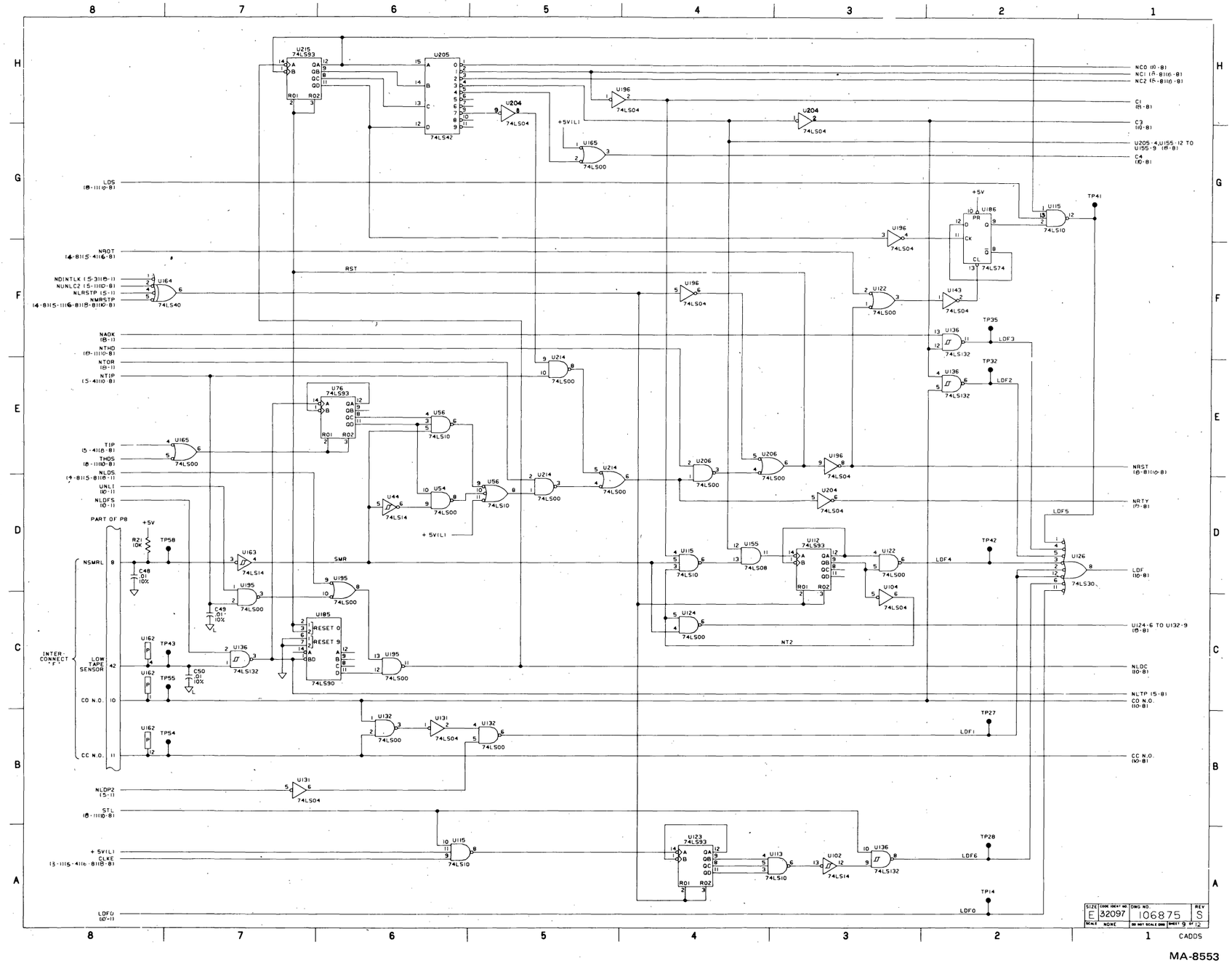
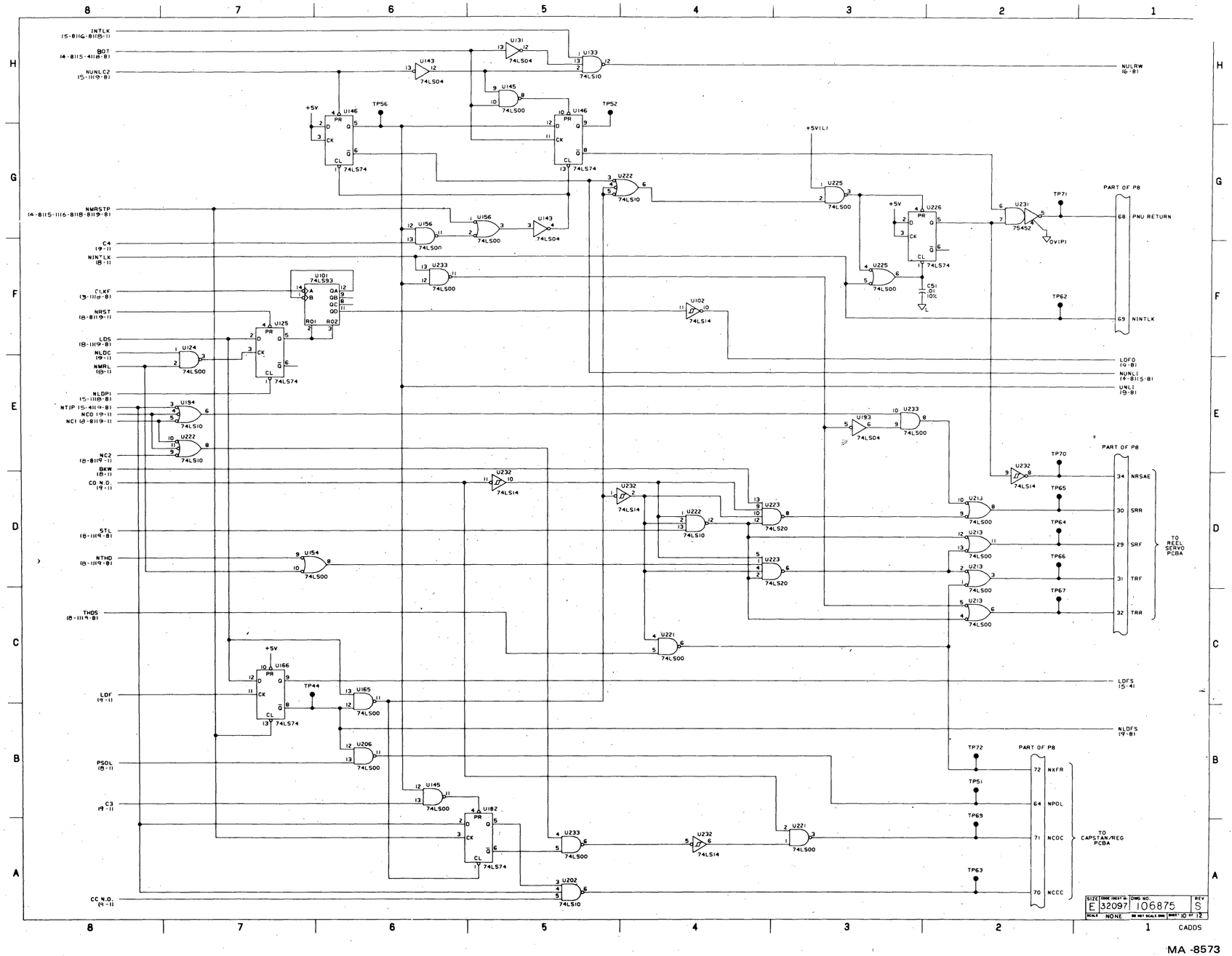


Figure 13 Schematic, Control M2 (Sheet 9 of 12)



MA -8573

Figure 13 Schematic, Control M2 (Sheet 10 of 12)

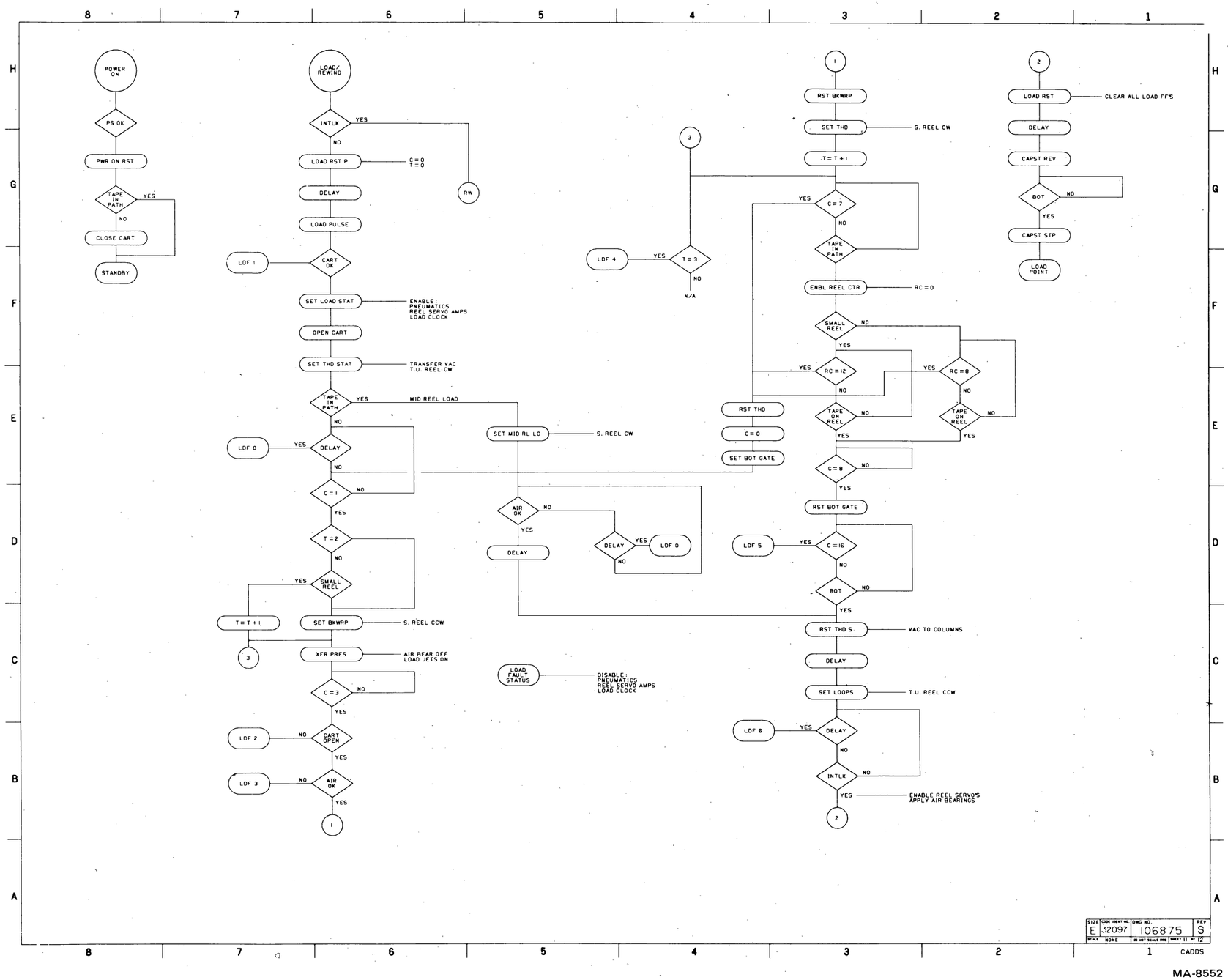


Figure 13 Schematic, Control M2 (Sheet 11 of 12)

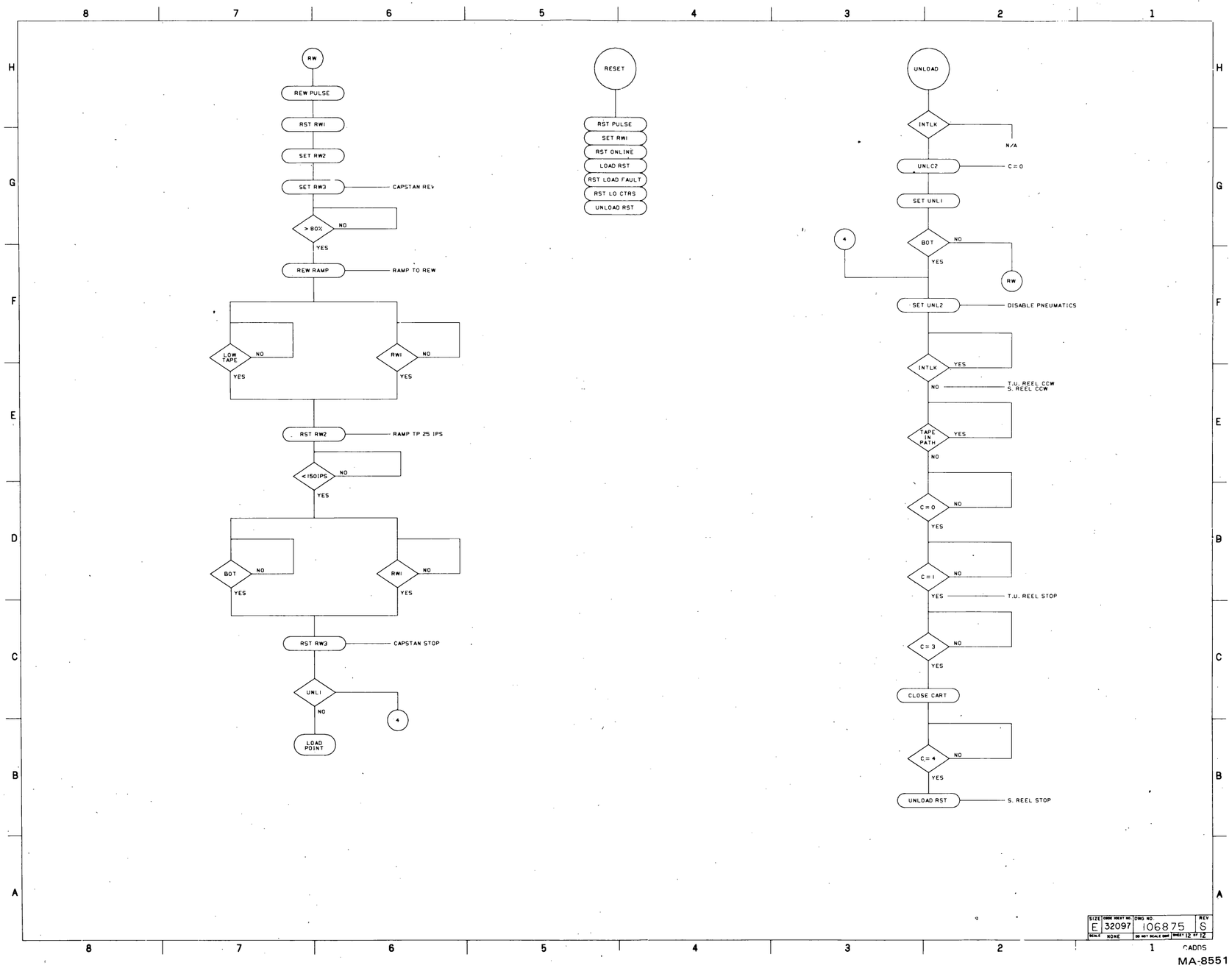


Figure 13 Schematic, Control M2 (Sheet 12 of 12)

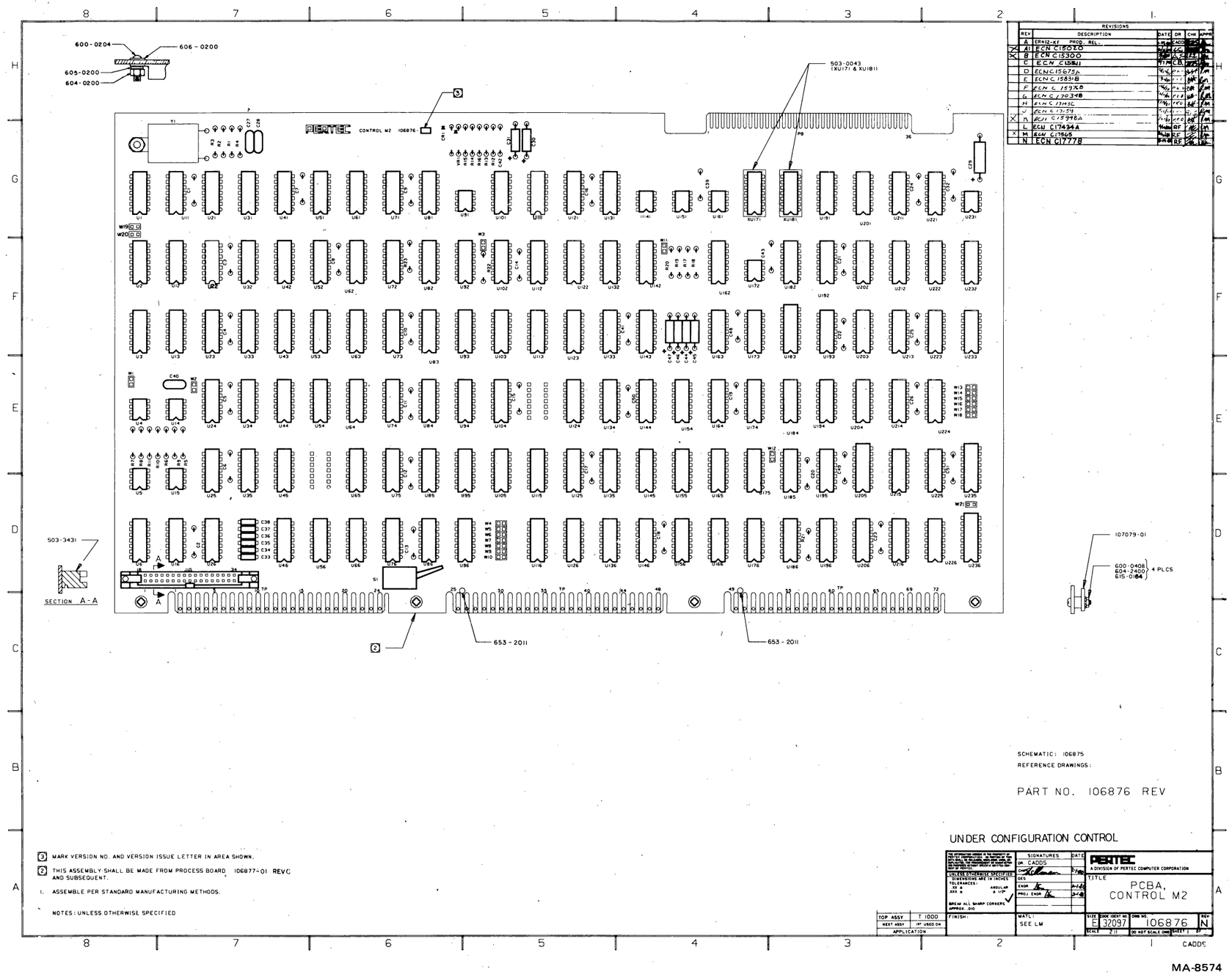


Figure 14 PCBA, Control M2

TABLE I [1]

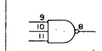
PART NO.	REFERENCE DESIGNATION
100-0475	R117,120,147,150
100-1025	R5,6,16,19,20,23,24,38,39,60, 61,99,101,111,112,129,131,141,142
100-1035	R8,9,62,63,68
100-1045	R1,2, [illegible],159
100-1055	R69,75
100-1815	R17
100-1835	R35
100-2245	R4
100-4355	R46,85
100-3305	R116,119,146,149
100-4715	R15,113,115,143,145
100-4725	R7,13,14,18,27,28,29,30,31,32,33, 34,36,55,57,59,94,96,98,100,130
100-4735	R3,49,88
100-4745	R12
101-4705	R127,128,157,158
102-4715	R70
102-5625	R64,67
103-1025	R37,114,118,144,148
107-1333	R80
107-1623	R41
107-1000	R65,66
107-1003	R40,54,79
107-2152	R51,74,90
107-2611	R72
107-4643	R11
107-5111	R77,78
107-1780	R56,58,95,97
107-7501	R73
107-3832	R50,89
107-7503	R10,47,48,86,87
107-6190	R102,103,132,133
107-4642	R92
107-6612	R53,93
109-8215	R21,22,25,26
110-0003	R110,140
115-0004	R107,109,123,126,137,139,153,156
121-1030	R76
121-5040	R52,91
130-1015	C15,23
131-2230	C21
131-4701	C1
135-1002	C14,22
135-1031	C4,5,6,7
135-2062	C37,38,49,50
135-4742	C29THRU 36,C41 THRU 48,C52
135-1541	C28,40
139-1020	C18,19,26,27
139-2244	C2[illegible],9,10,11,12,13
139-2262	C3,20
139-4755	C16,17,24,25
142-1370	C39,51
200-6306	Q24,26,42,44
200-0041	Q27,30,45,48
200-0042	Q17,20,35,38

TABLE I [1]

PART NO.	REFERENCE DESIGNATION
200-0001	Q18,19,21,22,28,29,31,32,36,37, 39,40,46,49,50
200-4037	Q3,9
200-4123	Q1,10,11,15,33
200-4125	Q2,12,13
200-6058	Q8
200-2905	Q4,5,6,7,16,23,25,34,41,43
204-0074	Q14
300-4446	CR1 THRU 10,15,16,17,18,23,24,25,26
300-8810	CR11,12,13,14,19,20,21,22
330-0335	VR3
331-0605	VR2
331-1905	VR1
400-0307	U5,8,9,14,16
400-0311	U6,15,17
403-0002	U7,18
403-4705	R104,105,121,124,134,135,151,154
403-3305	R106,108,122,125,136,152,155
514-0001	S1
515-0005	L1,2,3,4
700-7416	U2,11
710-7400	U4,13
710-7410	U3,10,12
710-7474	U1

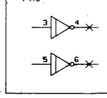
TABLE V [5]

U3 74LS10



U4 74LS00

U11 7416



U12 74LS10

U13 74LS00

REFERENCE DESIGNATION		
LAST USED	NOT USED	DELETED
C52		
CR26		
J20		
L4		
Q50		
R159		R42 THRU 45 81 THRU 84
S1		
TP72	[17]	
U18		
VR3		

TABLE IV [4]

I.C. TYPE	+15V	+5V	GND	-15V
74LS00		14	7	
74LS10		14	7	
7416		14	7	
LM307	7			4
LM311	8			4

REVISIONS

REV.	DESCRIPTION	DATE	DR	CHK	APPR
—	A. ERN 9-2K PRODUCTION RELEASE; B, ECN 10447; C, ECN 10624A; D, ECN 10646; E, ECN10777; F, ECN 11067; G, ECN 11096; H, ECN 11115; J, ECN 11529; K, ECN 11925; KI, ECN C12190; L, ECN C12178; M, ECN C15194;				
N	ECN C15442 REVISED AND PLOTTED	[illegible]	[illegible]	[illegible]	[illegible]
P	ECN C17001B	[illegible]	[illegible]	[illegible]	[illegible]
R	ECN C17371	[illegible]	[illegible]	[illegible]	[illegible]
R1	ECN C17549	[illegible]	[illegible]	RF	[illegible]
S	ECN C17691	[illegible]	[illegible]	ET	[illegible]
T	ECN C17690	[illegible]	[illegible]	EA	[illegible]
U	ECN C17881	[illegible]	[illegible]	SRC	[illegible]
V	ECN C19020	[illegible]	[illegible]	[illegible]	[illegible]

[7] TP1 THRU 3,5,7,9,11,13,15,17,19,20
25 THRU 48,54,63 ARE NOT USED.

16 [RESERVED]

15 [RESERVED]

14 [RESERVED]

[13] COMPONENTS REQUIRE HEATSINK.

12. RESISTORS WITH 1% TOLERANCE ARE 1/8W.

11. SIGNALS ARE CROSS-REFERENCED BETWEEN SHEETS AND WITHIN A SHEET BY NUMBERS APPEARING UNDER THE ASSOCIATED LOGIC TERM MNEMONIC. THE FIRST NO. IS THE SHEET NO. AND THE SECOND NO. IS THE ZONE NO.

10. DIODES ARE 1N4446.

9. PNP TRANSISTORS ARE [illegible].

8. NPN TRANSISTORS ARE 200-0001.

7. CAPACITOR VALUES ARE IN MICROFARADS

6. RESISTOR VALUES ARE IN OHMS 5%,1/4.

[5] FOR SPARE LOGIC ELEMENTS SEE TABLE V.

[4] FOR I.C. GENERIC TYPE NUMBER AND GROUND/VOLTAGE PIN NUMBERS SEE TABLE IV.

3 [RESERVED]

2 [RESERVED]

[1] FOR PART NUMBER OF COMPONENTS NOT AFFECTED BY VERSION NUMBER, SEE TABLE I.

NOTES: UNLESS OTHERWISE SPECIFIED

SPECIFICATION 106929
ASSEMBLY 106926
REFERENCE DRAWINGS

THIS DRAWING IS UNDER CONFIGURATION CONTROL

SIGNATURES	DATE
DR CADDS	[illegible]
CHK [illegible]	[illegible]
DES	[illegible]
ENGR [illegible]	[illegible]
PROJ ENGR [illegible]	[illegible]

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES: .XX ± .010 .XXX ± .005 ANGULAR ± 1/2° BREAK ALL SHARP CORNERS .010 .005

PERTEC
A DIVISION OF PERTEC COMPUTER CORPORATION

TITLE SCHEMATIC, REEL SERVO

106926	T1000
NEXT ASSY	USED ON
APPLICATION	

FINISH: MATL:

SIZE E | CAGE IDENT NO. 32097 | DWG NO. 106925 | REV

SCALE NONE | DO NOT SCALE DWG | SHEET 1 OF 4

MAINFRAME CADDS

MA-8550

Figure 15 Schematic, Reel Servo (Sheet 1 of 4)

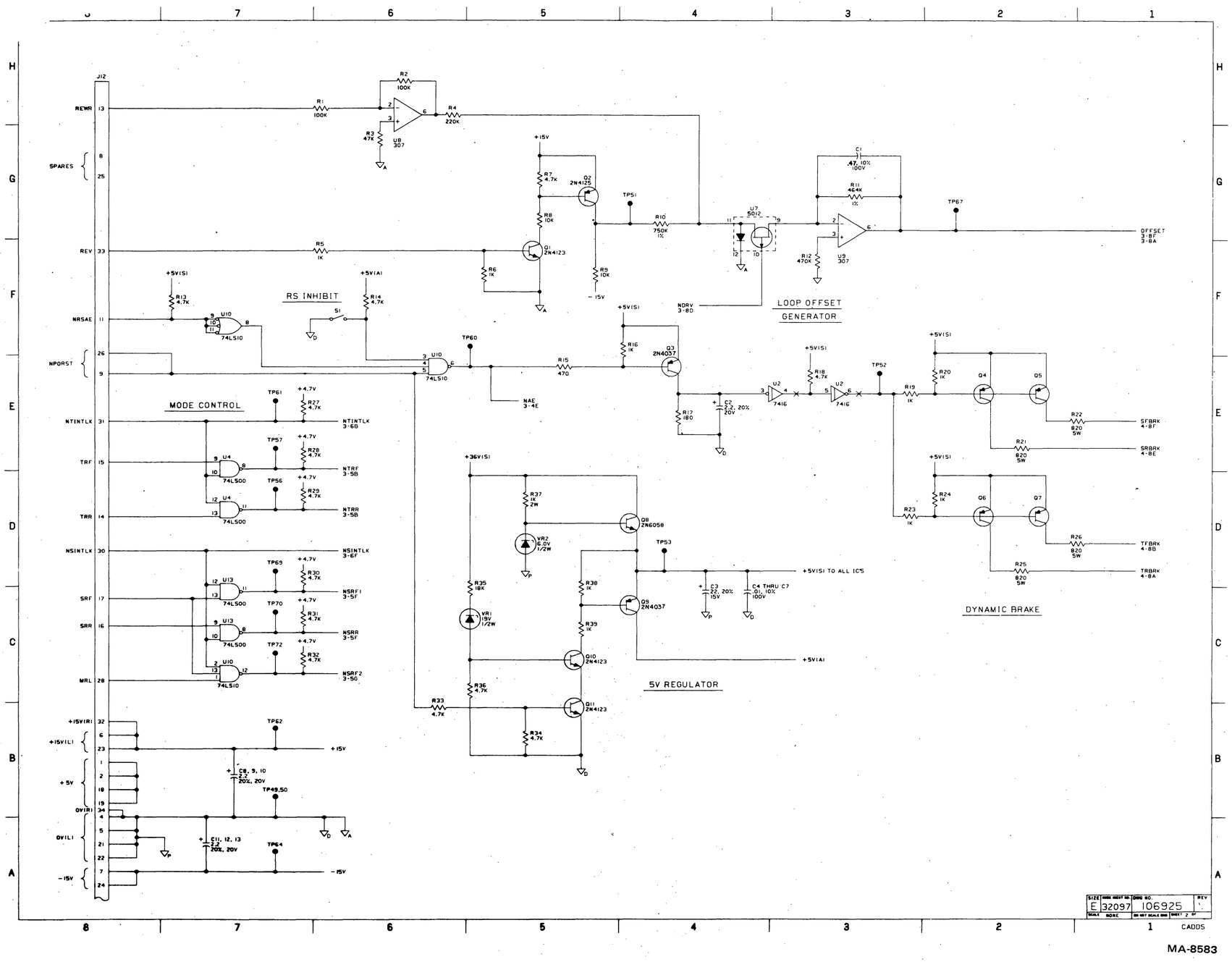


Figure 15 Schematic, Reel Servo (Sheet 2 of 4)

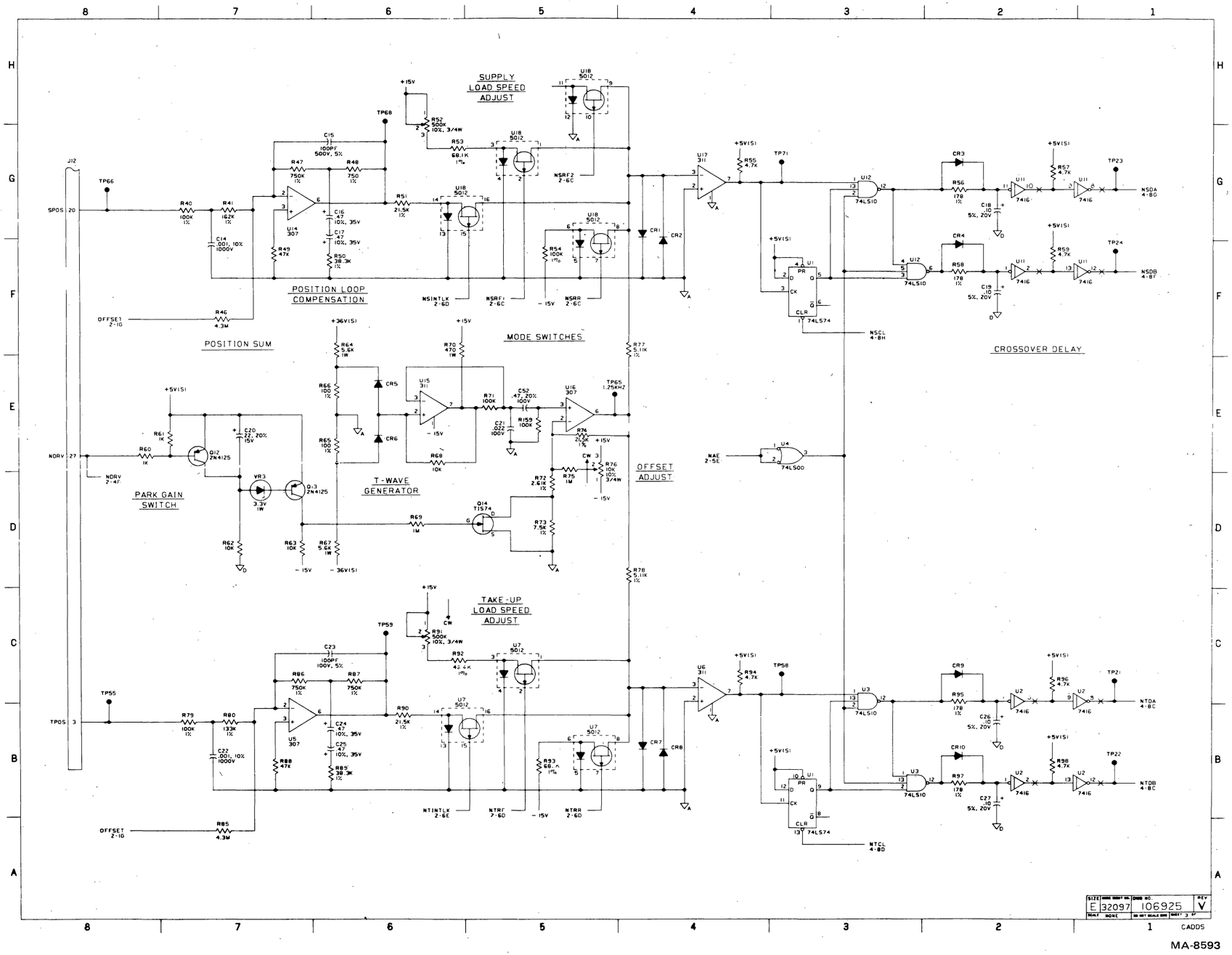


Figure 15 Schematic, Reel Servo (Sheet 3 of 4)

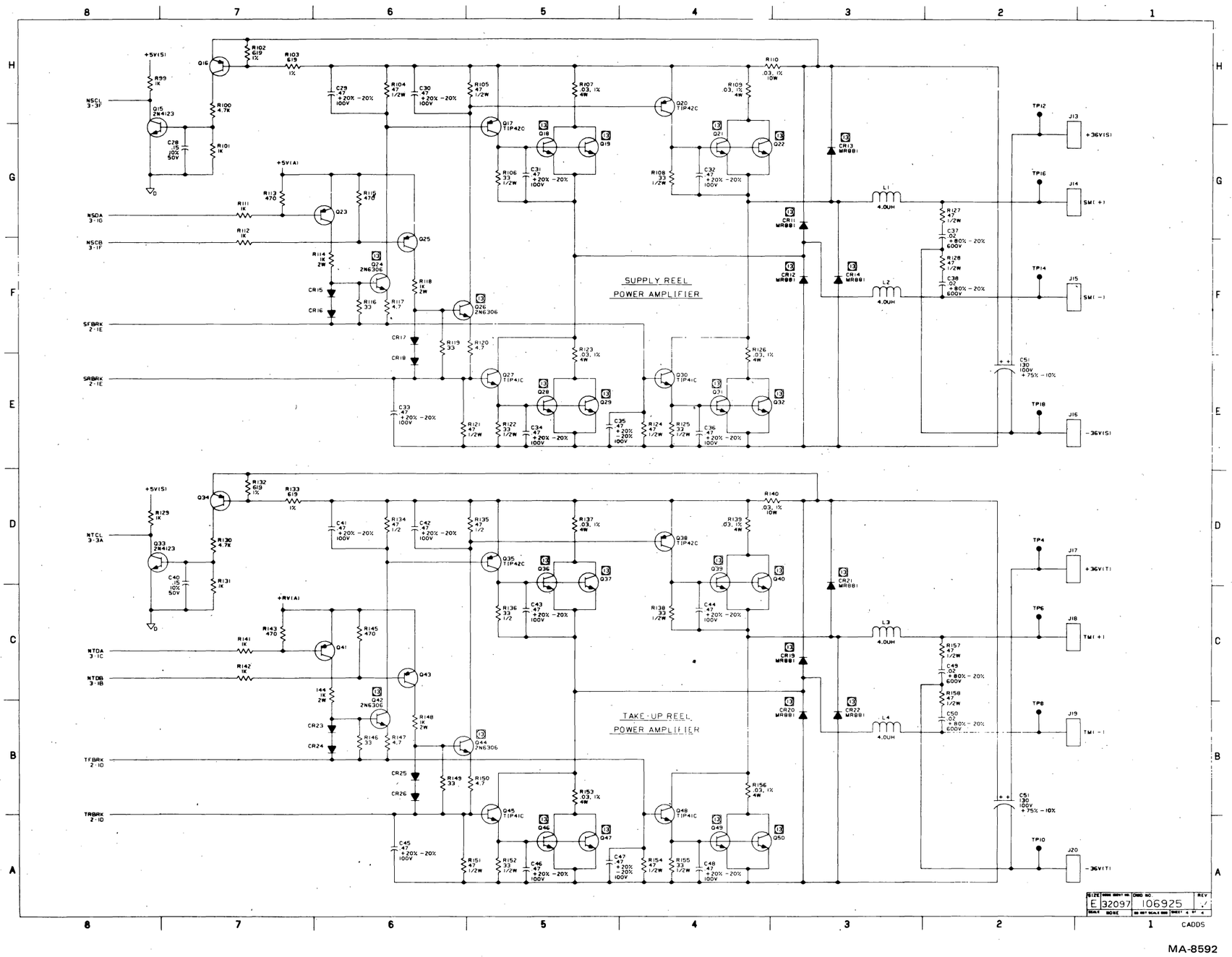
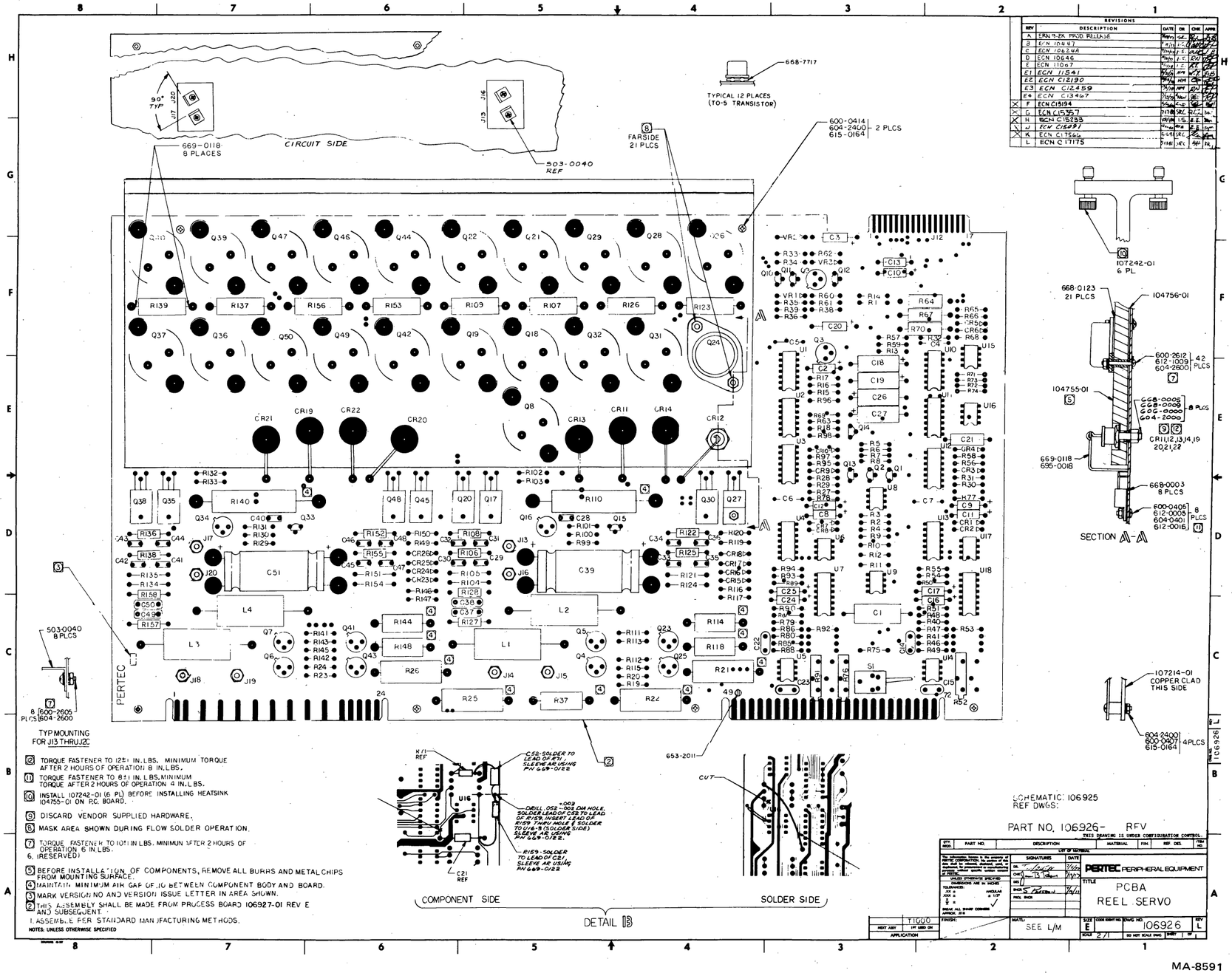


Figure 15 Schematic, Reel Servo (Sheet 4 of 4)



1. TORQUE FASTENER TO 12± IN.LBS. MINIMUM TORQUE AFTER 2 HOURS OF OPERATION 8 IN.LBS.
2. TORQUE FASTENER TO 8± IN.LBS.MINIMUM TORQUE AFTER 2 HOURS OF OPERATION 4 IN.LBS.
3. INSTALL 107242-01 (6 PL) BEFORE INSTALLING HEATSINK 104755-01 ON P.C. BOARD.
4. DISCARD VENDOR SUPPLIED HARDWARE.
5. MASK AREA SHOWN DURING FLOW SOLDER OPERATION.
6. TORQUE FASTENER TO 10± IN.LBS. MINIMUM AFTER 2 HOURS OF OPERATION 6 IN.LBS.
7. (RESERVED)
8. BEFORE INSTALLATION OF COMPONENTS, REMOVE ALL BURRS AND METAL CHIPS FROM MOUNTING SURFACE.
9. MAINTAIN MINIMUM AIR GAP OF .10 BETWEEN COMPONENT BODY AND BOARD.
10. MARK VERSION NO AND VERSION ISSUE LETTER IN AREA SHOWN.
11. THIS ASSEMBLY SHALL BE MADE FROM PROCESS BOARD 106927-01 REV E AND SUBSEQUENT.
12. ASSEMBLE PER STANDARD MANUFACTURING METHODS.

NOTES: UNLESS OTHERWISE SPECIFIED

Figure 16 PCBA, Reel Servo

TABLE I (1)

PART NO.	REFERENCE DESIGNATION
100-1015	R24, 69, 101, 102, 137, 147, 154, 158, 176
100-1025	R1, 3, 14, 18, 21, 22, 42, 44, 54, 60, 62, 70, 73, 79, 84, 85, 87 R88, 97, 98, 100, 109, 110, 111, 132, 144, R145, 150, 151, 152, 155, 163, 171, 172, 173
100-1035	R2, 4, 6, 8, 10, 11, 13, 16, 17, 20, 45, 52, 55, R56, 57, 61, 63, 67, 71, 115, 121, 130, 149, 164 THRU 169
100-1045	R38, 50, 75
100-1055	R5, 15, 53, 86, 131, 134, 170
100-1005	R174
100-1835	R34, 35, 76, 114, 122
100-2225	R156, 99
100-3315	R108, 125, 126, 177
100-4705	R91
100-4715	R128, 139
100-4725	R7, 9, 12, 19, 74, 129, 136, 138, 178
100-5605	R95, 96, 104, 116, 117, 118, 119, 120, 124
100-2725	R46
101-107	R175
101-1015	R146, 153, 157
403-1805	R30, 80
103-1015	R51
103-4715	R135, 148
107-1001	R27, 106
107-1002	R25, 37, 39, 40, 41, 49, 103
107-1003	R48
107 2151	R94
107-3832	R36.
107-6810	R64
107-6811	R26
107-5112	R72
108-4715	R23, 68
109-0500	R133
109-2715	R43
111-0001	R89
115-0005	R31, 32, 33, 81, 82, 83
118-0013	R127
121-5010	R59
121-1020	R47, 179
130-1015	C14, 29
130-2215	C18
130-3315	C4
131-3320	C2, 5, 8, 34
131-4720	C3, 6, 7
131-4830	C33

TABLE I (CONT'D) (1)

PART NO.	REFERENCE DESIGNATION
135-1701	C12, 13, 32
139-4762	C39
139-2244	C19, 25, 30, 31
139-2262	C9, 10, 17, 20, 21, 16
139-3302	C15
139-6845	C24, 28, 35, 36
142-1070	C26, C22, 38
142-5060	C1, 11
200-0041	Q19, 42, 43, 45, 47,
200-0042	Q6, 36
200-0004	Q26, 32, 35
200-4037	Q41,
200-4123	Q2, 4, 11, 17, 18, 20, 24, 30, 31, 37, 38, 51, 52, 55, 56
200-4125	Q1, 3, 13, 14, 28, 29, 33, 34, 50, 54, 38
200-4348	Q7, 8, 9, 21, 22, 23
200-5321	Q10
200-5323	Q16, 27, 44, 46
201-0126	SCR2, 3
201-3669	SCR1
204-0074	Q5, 12, 15, 25, 53
300-4002	CR1, 4, 5, 8, 10, 11
300-4446	CR2, 3, 6, 7, 9, 12
331-0395	VR2
330-0475	VR4, 5, 9
330-0565	VR1
330-0515	VR7
330-1205	VR8
331-1905	VR3, 6
400-0305	U2
400-0307	U3, 8, 9, 10, 15
400-0325	U1
400-0318	U12
403-0002	U4, 13
710-7400	U5, 11, 14
710-7404	U7
710-7410	U6

(2) TABLE II

ASSEMBLY 104758 VERSION NO.	VERSION CHARACTERISTIC	Q39, 40, 48, 49 R140, 141, 142, 143, 159, 160 161 162 USAGE (3)	R112		R28, 29		R58, 65, 77		C37	L1	R90		R92		R105		W1	R66, 78	
			VALUE	PART NO.	VALUE	PART NO.	VALUE	PART NO.	131-2060	515-1011	VALUE	PART NO.	VALUE	PART NO.	VALUE	PART NO.	PART NO.	VALUE	PART NO.
-01	BASIC	OMIT	0.3	118-0033	26.1K	107-2612	82.5	107-0825	OMIT	OMIT	0.1	110-0011	10	100-1005	39	101-3905	OMIT	500	121-5010
-02	GCR	OMIT	0.15	118-0013	16.2K	107-1622	562	107-5620	USE	USE	0.1	110-0011	10	100-1005	39	101-3905	OMIT	1000	121-1020
-03	OEM STD	OMIT	0.3	118-0033	26.1K	107-2612	82.5	107-0825	OMIT	OMIT	0.03	110-0003	—	OMIT	—	OMIT	100-0005	500	121-5010

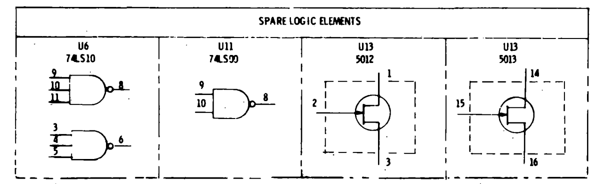
(3) TABLE III

PART NO.	REFERENCE DESIGNATIONS
100-1015	R143, 162
100-1025	R140, 142, 159, 160
101-1015	R141, 161
200-0041	Q40, 49
200-4037	Q39
200-5323	Q48

TABLE IV (4)

GROUND & VOLTAGE PIN NO.				
I.C. TYPE	+15V	+5V	GND (R)	-15V
74LS00		14	7	
74LS04		14	7	
74LS10		14	7	
LM307	7			4
LM318	7			4

TABLE V (5)



REFERENCE DESIGNATIONS

LAST USED	NOT USED	DELETED
C39		C27, C23
CR12		
P11		
Q56		
L1		
R179	R93, 113, 123	R107
SCR3		
TP71	(14)	
U15		
VR9		
W1		

REVISIONS

REV	DESCRIPTION	DATE	DR	CHK	APPR
	PROTOTYPE NO. 1, 2, 3, 4	[illegible]	[illegible]		
A	ERN 9-8W PRE PROD. RELEASE	[illegible]	[illegible]	[illegible]	[illegible]
B	ECN 9844	[illegible]	[illegible]	[illegible]	[illegible]
C	ECN 9903	[illegible]	[illegible]	[illegible]	[illegible]
D	ECN 9978	[illegible]	[illegible]	[illegible]	[illegible]
	ERN 9-PW PROD RELEASE	[illegible]	[illegible]	[illegible]	[illegible]
E	ECN 10176	[illegible]	[illegible]	[illegible]	[illegible]
F	ECN 10473	[illegible]	LA	[illegible]	[illegible]
G	ECN 10693	[illegible]	J.S.	[illegible]	[illegible]
H	ECN 10815	[illegible]	[illegible]	[illegible]	[illegible]
J	ECN 10942	[illegible]	[illegible]	[illegible]	[illegible]
K	ECN 11626B	[illegible]	[illegible]	[illegible]	[illegible]
L	ECN 11938A	[illegible]	L.R	[illegible]	[illegible]
L1	ECN C12190	[illegible]	NM	[illegible]	[illegible]
M	ECN C12183A	[illegible]	NM	[illegible]	[illegible]
N	ECN C12380	[illegible]	CJ	[illegible]	[illegible]
P	ECN C12967	[illegible]	[illegible]	[illegible]	[illegible]
R	ECN C13427	[illegible]	[illegible]	[illegible]	[illegible]
S	ECN C13818	[illegible]	SAC	[illegible]	[illegible]
T	ECN C13697	[illegible]	L.R	[illegible]	[illegible]
U	ECN C14044	[illegible]	SAC	[illegible]	[illegible]
V	ECN C14222A	[illegible]	SAC	[illegible]	[illegible]
W	ECN C1425'	[illegible]	M A	[illegible]	[illegible]
Y	ECN C14528A	[illegible]	M A	[illegible]	[illegible]
Z	ECN C14448A	3/5 80	M A	[illegible]	[illegible]
AA	ECN C14986	[illegible]	SAC	[illegible]	[illegible]
AB	ECN C15149	[illegible]	L.S.	[illegible]	[illegible]
AC	ECN C15329A	7-9-80	L.S.	[illegible]	[illegible]
AD	ECN C15330	7-9-80	C.B.	[illegible]	[illegible]
AE	ECN C15557	[illegible]	L.S.	[illegible]	[illegible]
AF	ECN C17296A	2/20/81	FHC	[illegible]	[illegible]
AG	ECN C17538	[illegible]	PRO	[illegible]	[illegible]

(14) TP3, 4, 5 THRU 10, 14, 16, 17, 20, 21, 22, 23, 25 THRU 48, 53, 54, 60 THRU 64, 66, 67, 68, 69, 72

(13) COMPONENTS REQUIRE HEATSINK.

12 RESISTORS WITH 1% TOL. ARE 1/8W.

11 SIGNALS ARE CROSS-REF BETWEEN SHEETS AND WITHIN A SHEET BY NUMBERS APPEARING UNDER THE ASSOCIATED LOGIC TERM MNEMONIC. THE FIRST NO. IS THE SHEET NO. AND THE SECOND NO. IS THE ZONE NO.

10. DIODES ARE 1N4446.

9. PNP TRANSISTORS ARE 2N4125.

8. NPN TRANSISTORS ARE 2N4123.

7. CAPACITOR VALUES ARE IN MICROFARADS, 20%, 35V.

6. RESISTOR VALUES ARE IN OHMS, 5%, 1/4W.

(5) FOR SPARE LOGIC ELEMENTS, SEE TABLE V.

(4) FOR I.C. GENERIC TYPE NO. AND GROUND/VOLTAGE PIN NOS. SEE TABLE IV.

(3) FOR PART NUMBER, SEE TABLE III.

(2) FOR VALUE, PART NUMBER AND USAGE OF COMPONENTS AFFECTED BY VERSION NUMBER, SEE TABLE II.

(1) FOR PART NUMBER OF COMPONENTS NOT AFFECTED BY VERSION NUMBER, SEE TABLE I.

NOTES: UNLESS OTHERWISE SPECIFIED

THIS DRAWING IS UNDER CONFIGURATION CONTROL.

PERTEC
PERIPHERAL EQUIPMENT DIVISION

TITLE SCHEMATIC CAPSTAN/REGULATOR

104758 | APPLICATION

SIZE J | 104757 | REV AG

MA-8581

Figure 17 Schematic, Capstan/Regulator (Sheet 1 of 4)

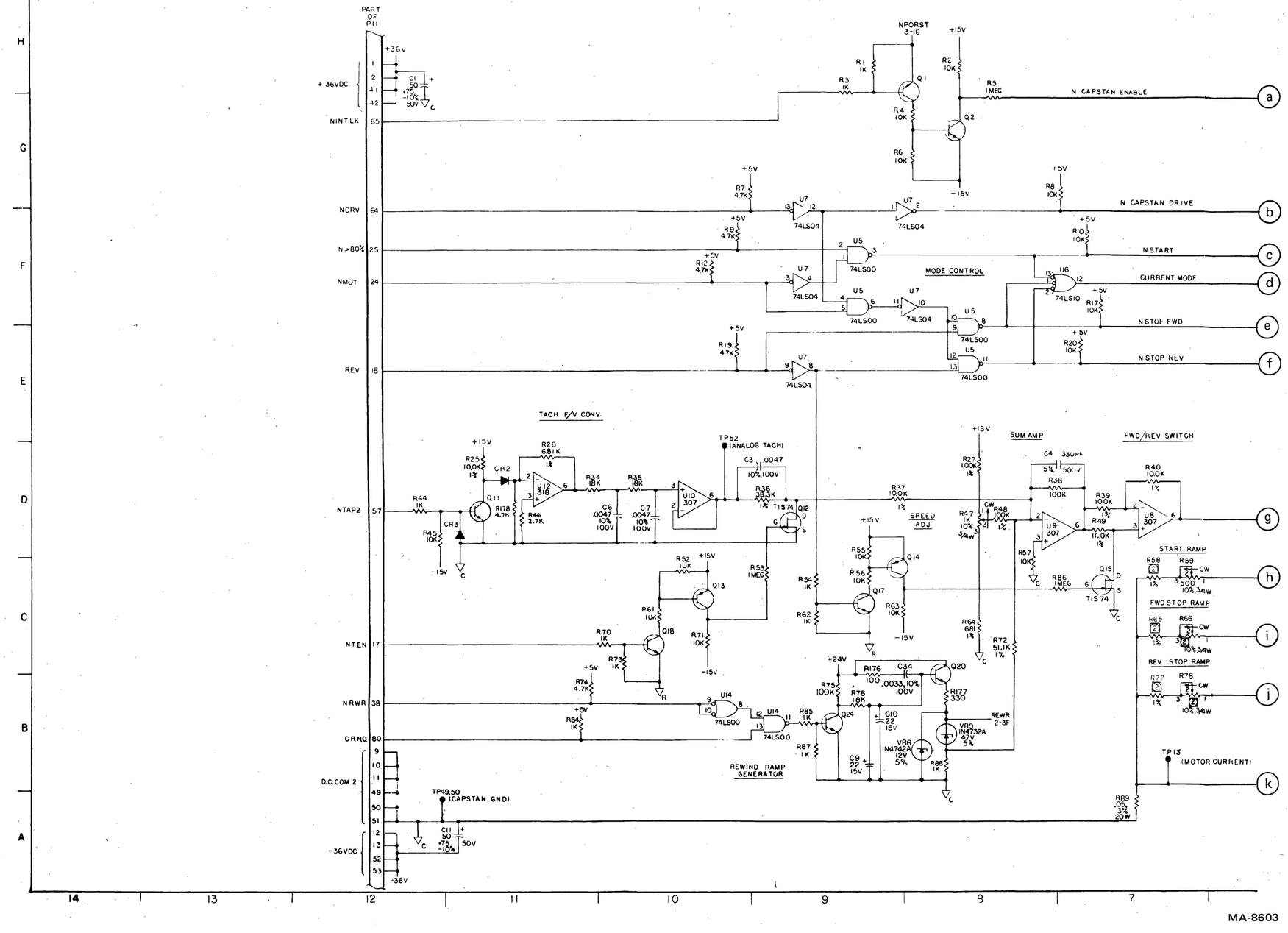


Figure 17 Schematic, Capstan/Regulator (Sheet 2 of 4)

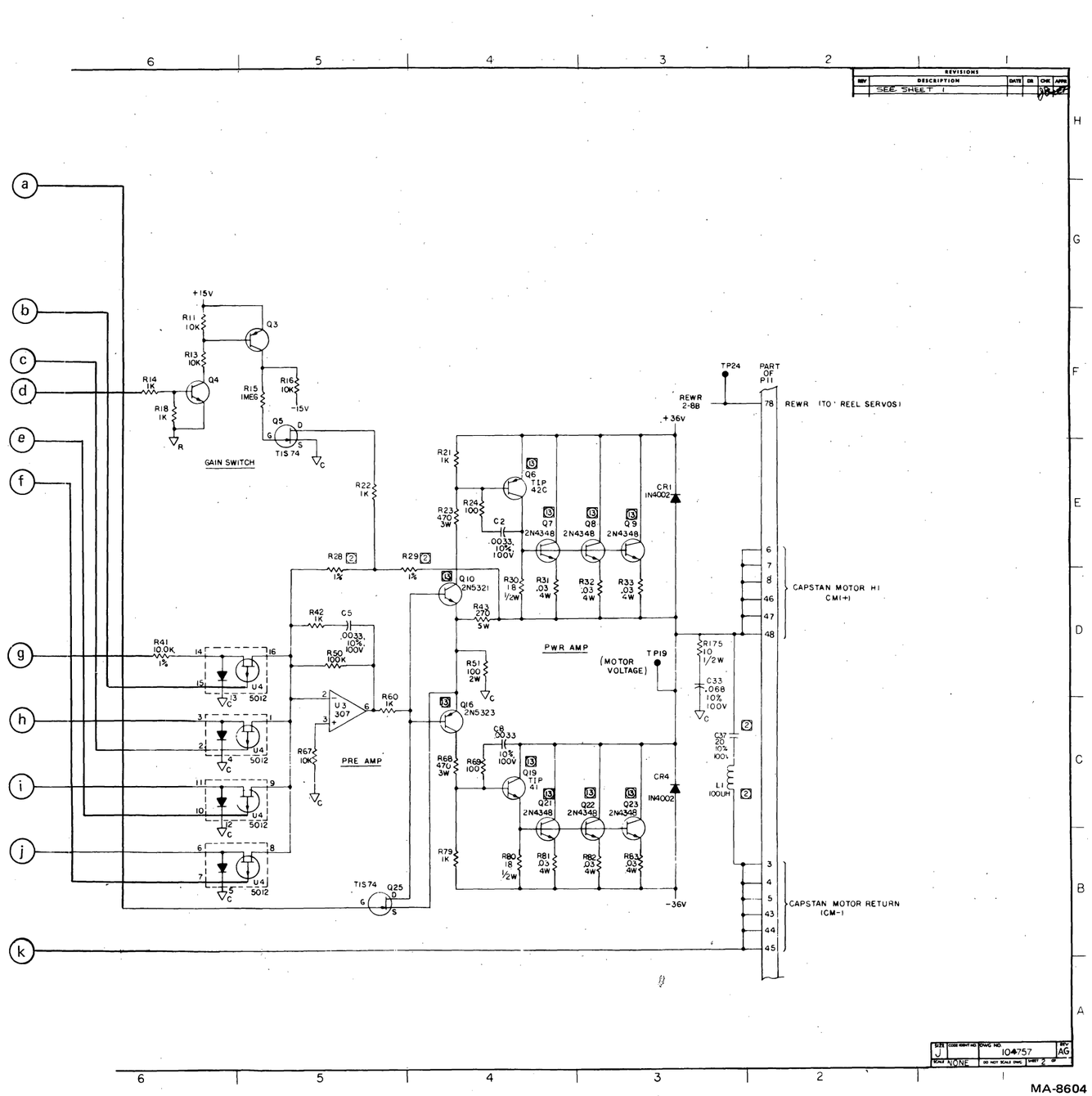


Figure 17 Schematic, Capstan/Regulator (Sheet 3 of 4)

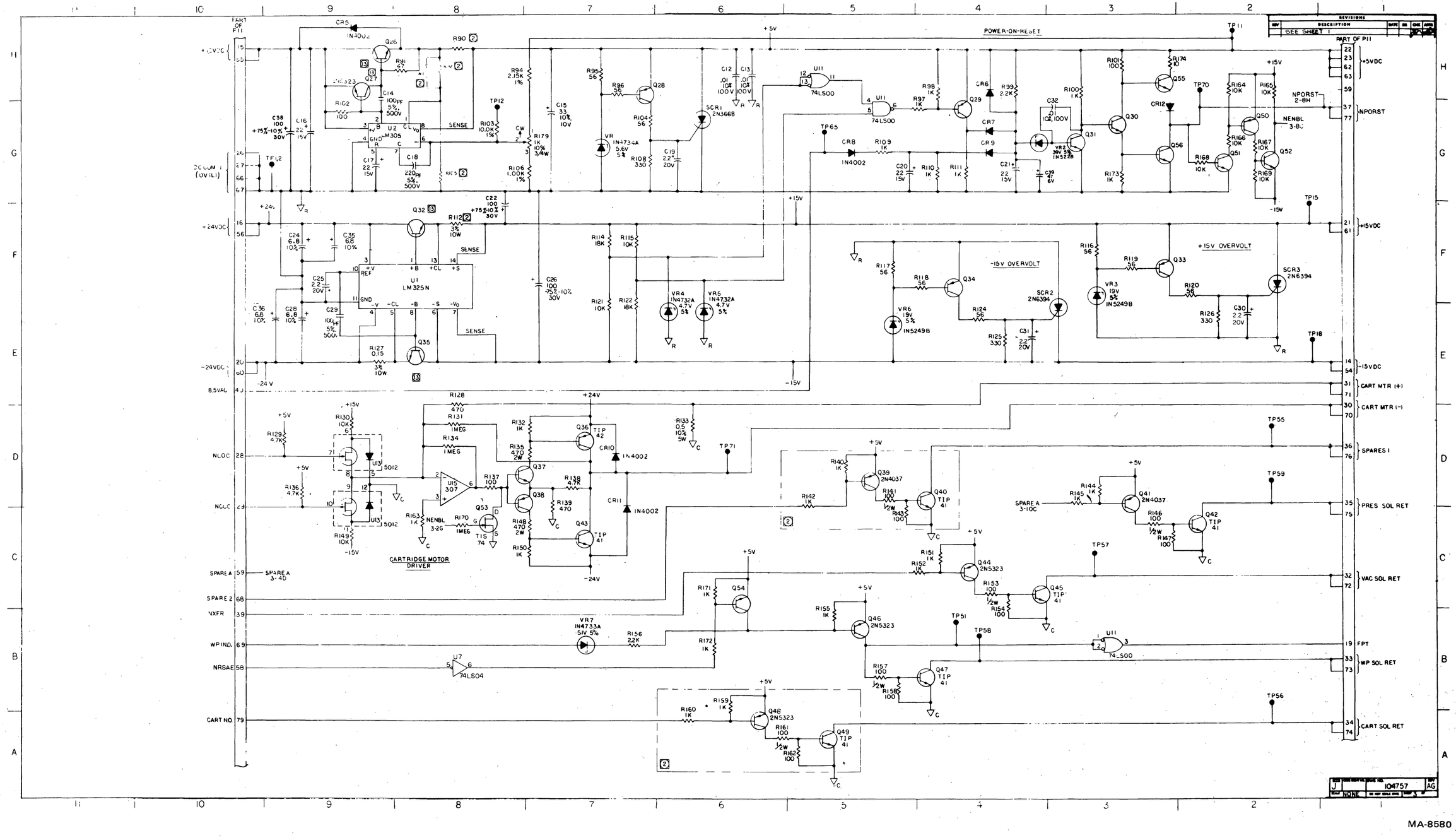


Figure 17 Schematic, Capstan/Regulator (Sheet 4 of 4)

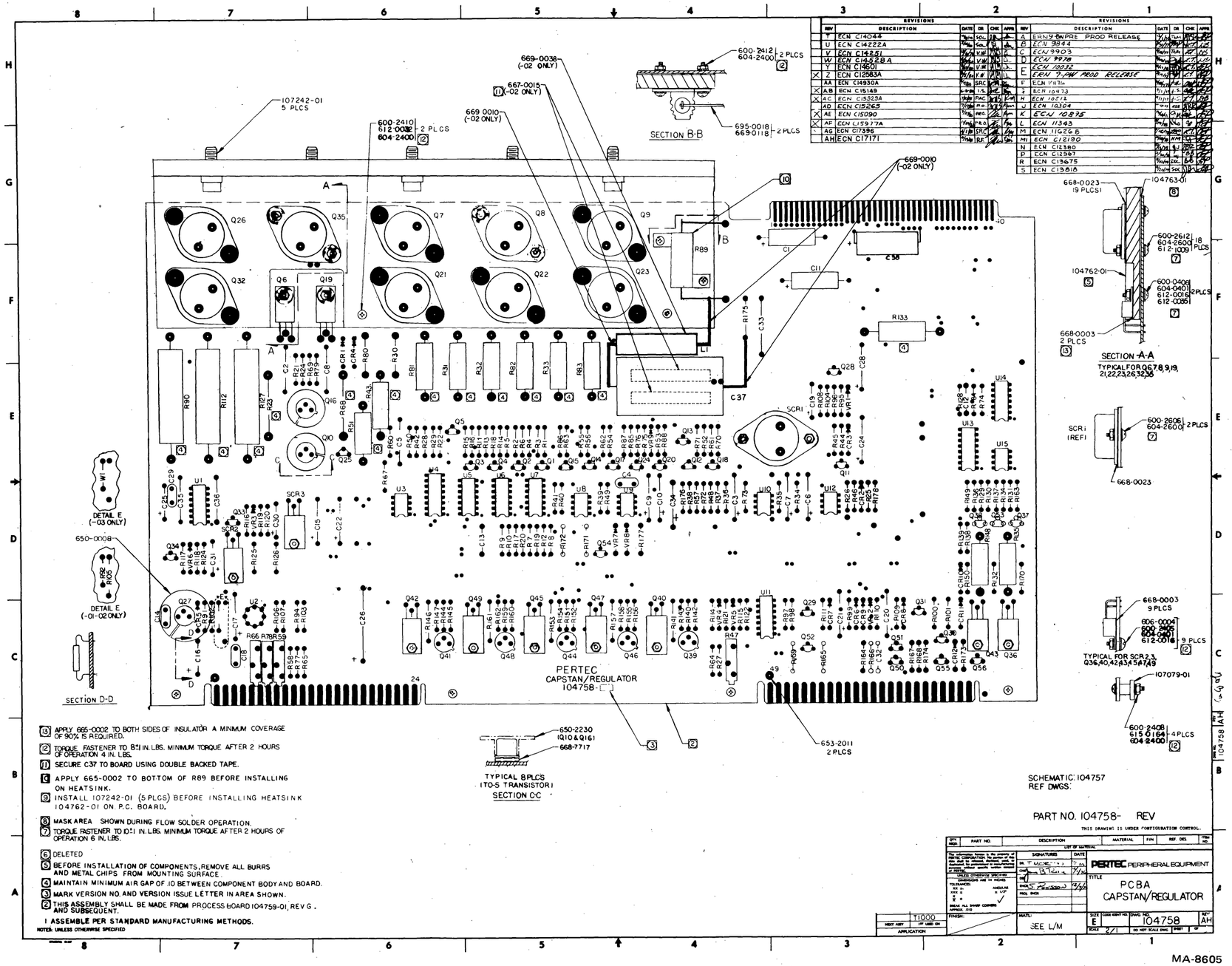


Figure 18 PCBA, Capstan/Regulator

REV	DESCRIPTION	DATE	DR	CHK	APPR
A	ERN 10-NF PRE-PROD RELEASE				
B	ECN 12703		L R		
C	ECN 12867		MP		
D	ECN 12951		MP		
E	ECN 13257		MP		
F	ECN 13480		RIB		
G	ECN 13845		RIB		
H	ECN 14099 ERN 12-JZ PROD RELEASE				
J	ECN 14749		SRC		
J1	ECN C15020				
K	ECN C15314	7-3-80			
L	ECN C17961	12-4-81	SRC		

TABLE I ①

PART NO.	REFERENCE DESIGNATION
100-1005	R21,38,45
100-1025	R1,2,8,23,29,32,40,49,51,52,53,54,57,65,66, 67,68,76,77,78,79,87,88,89,90,98,99,100, 101,109,110,111,112,120,121,122,123,131,132,133, 134,142,143,144,145,169,188,207,226,245,264, 283,302,321,327, 328.
100-1515	R24,41
100-1525	R62,75,86,97,108,119,130,141,152
100-1845	R168,187,206,225,244,263,282,301,320
100-2215	R58,59,69,70,80,81,91,92,102,103,113,114 124,125,135,136,146,147
100-2225	R11,158,159,177,178,196,197,215,216,234,235, 253,254,272,273,291,292,310,311
100-2235	R20,37
100-3325	R14
100-3335	R155,156,164,165,174,175,183,184,193,194,202, 203,212,213,221,222,231,232,240,241,250,251, 259,260,269,270,278,279,288,289,297,298, 307,308,316,317
100-3925	R153,172,191,210,229,248,267,286,305
100-4705	R154,157,173,176,192,195,211,214,230,233,249, 252,268,271,287,290,306,309
100-4715	R25,26,42,43
100-4725	R3,4,5,6,9,10,15,325,326
100-5605	R60,61,73,74,84,85,95,96,106,107,117,118, 128,129,139,140,150,151
100-5625	R12,13,18,27,28,30,31,35,170,171,189,190,208, 209,227,228,246,247,265,266,284,285,303, 304,322,323
100-5645	R16,17,33,34,160,163,181,182,200,201,219,220, 238,239,257,258,276,277,295,296,314,315
101-1025	R7
101-3315	R324
101-8205	R46
102-8215	R63,64
103-2205	R44,47
107-1211	R167,186,205,224,243,262,281,300,319
107-1620	R55,56,71,72,82,83,93,94,104,105,115,116,126, 127,137,138,148,149
107-2872	R166,185,204,223,242,261,280,299,318
120-0001	U61,
120-0003	U218
126-1021	R19,22,36,39
126-5031	R48,50
130-4705	C2,4
131-3330	C140,141
135-2242	C13,14,15,18,19,24,25,26,29,30,35,36,37,40, 41,46,47,48,51,52,57,58,59,62,63,68,69,70, 73,74,79,80,81,82,83,90,91,92,93,94,101, 102,103,104,105
135-4742	C1, 132,133,134,135,136,137,138,139
139-2244	C6,7,8,9,10,112,113,114,115,116,117,118, 119,120,121,122,123,124,125,127,128,129,130,131
139-2262	C3,5
200-3200	Q7,11
200-3251	Q18,19,21,22,24,25,27,28,30,31,33,34,36,37, 39,40,42,43
200-4123	Q1,3,8,12
200-4125	Q2,4,9,10,17,20,23,26,29,32,35,38,41
200-5321	Q5,6
204-0074	Q13,14,15,16,44 THRU 61

TABLE I ①

PART NO.	REFERENCE DESIGNATION
300-4002	CR2,4,11,12,13,14,15,16,17,18,25
300-4446	CR1, 5, 7,8,9,10,22,23,24,26 THRU 67
331-0395	VR5
330-0565	VR2
330-0685	VR1,3
330-1005	VR4
331-0605	VR6
400-0319	U134,144,154,164,174,184,194,204,214
400-0592	U132,142,152,162,172,182,192,202,212
400-5558	U116 ,
700 5452	U149,150,179,180,208
700-7404	U92 , U112
700-7407	U138,168,198
700-7406	U3,23,43,63,83,122
710-4123	U99
710-4132	U148,158,159,169,178,188,189
710-4158	U11,31,41
710-7400	U102
710-7414	U21,51
710-7474	U1,2,12,22,32,42,52,62,72,82
710-7486	U13,53,73

TABLE V ⑤

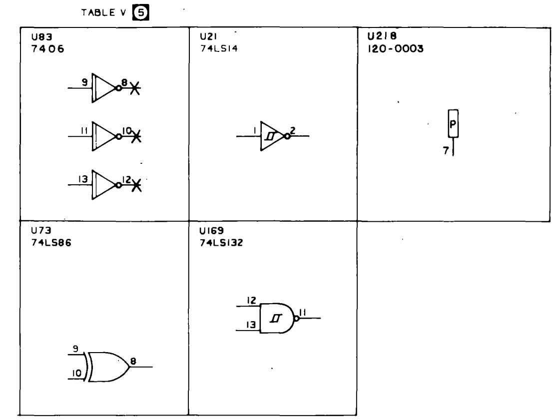


TABLE II ②

ASSEMBLY 107860 VERSION NO.	VERSION CHARACTERISTICS	C11		C12		C16,27,38,49,60, C71,84,95,106		C17,28,39,50,61, C72,85,96,107		C20,21,31,32,42,43, C53,54,64,65,75,76, C86,87,97,98,108,109		C22,33,44,55,66, C77,88,99,110		C23,34,45,56,67, C78,89,100,111		R161,179,199, R218,237,256, R275,294,313		R162,180,198, R217,236,255, R274,293,312		W1, W4	
		VALUE	PART NO.	VALUE	PART NO.	VALUE	PART NO.	VALUE	PART NO.	VALUE	PART NO.	VALUE	PART NO.	VALUE	PART NO.	VALUE	PART NO.	VALUE	PART NO.	VALUE	PART NO.
-01	125 IPS	22 PF	130-2205	100	130-1015	270 PF	130-2715	750 PF	130-7515	100PF	130-1015	2200 PF	135-2220	4700 PF	135-4720	1.96K	107-1961	560	100-5615	1/4 W	100-0005

TABLE IV ④

I.C. TYPE	GND	+5V
7404	7	14
7407	7	14
75452	4	8
74LS00	7	14
74LS04	7	14
7406	7	14
74LS14	7	14
74LS74	7	14
74LS86	7	14
74LS123	8	16
74LS132	7	14
74LS158	8	16

REFERENCE DESIGNATIONS		
LAST USED	NOT USED	DELETED
C141		C126
CR67	CR19,20,21	CR6,3
		K1
Q61		
R328		
VR6		
U219	U4-10,14-20,24-30,33-40,44-50, 54-60,64-71,74-81,84-91, 93-98,100,101,103-111,113-115, 117-121,123-131,133,135-137, 139-141,143,145-147,151,153, 155-157,160,161,163,165-167, 170,171,173,175-177,181,183,185-187, 190,191,193,195,197,199-201,203, 205-207,209-213,215-217	U219

12. RESISTORS WITH 1% TOLERANCE ARE 1/8W.
11. SIGNALS ARE CROSS-REFERENCED BETWEEN SHEETS AND WITHIN A SHEET BY NUMBERS APPEARING UNDER THE ASSOCIATED LOGIC TERM MNEMONIC. THE FIRST NO. IS THE SHEET NO. AND THE SECOND NO. IS THE ZONE NO.
10. (RESERVED)
9. (RESERVED)
8. (RESERVED)
7. CAPACITOR VALUES ARE IN MICROFARADS , 10%, 50V.
6. RESISTOR VALUES ARE IN OHMS , 5%, 1/4W.
⑤ FOR SPARE LOGIC ELEMENTS SEE TABLE V
④ FOR I.C. GENERIC TYPE NUMBER AND GROUND/VOLTAGE PIN NUMBERS SEE TABLE IV.
3. (RESERVED)
② FOR VALUE, PART NUMBER AND USAGE OF COMPONENTS AFFECTED BY VERSION NUMBER, SEE TABLE II.
① FOR PART NUMBER OF COMPONENTS NOT AFFECTED BY VERSION NUMBER, SEE TABLE I.

NOTES: UNLESS OTHERWISE SPECIFIED

UNDER CONFIGURATION CONTROL

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES XX ± XXX ± ANGULAR ± 1/2°
BREAK ALL SHARP CORNERS APPROX .010

SIGNATURES: DR CADDS; CHK; DES; ENGR; PROJ ENGR — DATE

NEXT ASSY | 1ST USED ON — APPLICATION

FINISH: MATL:

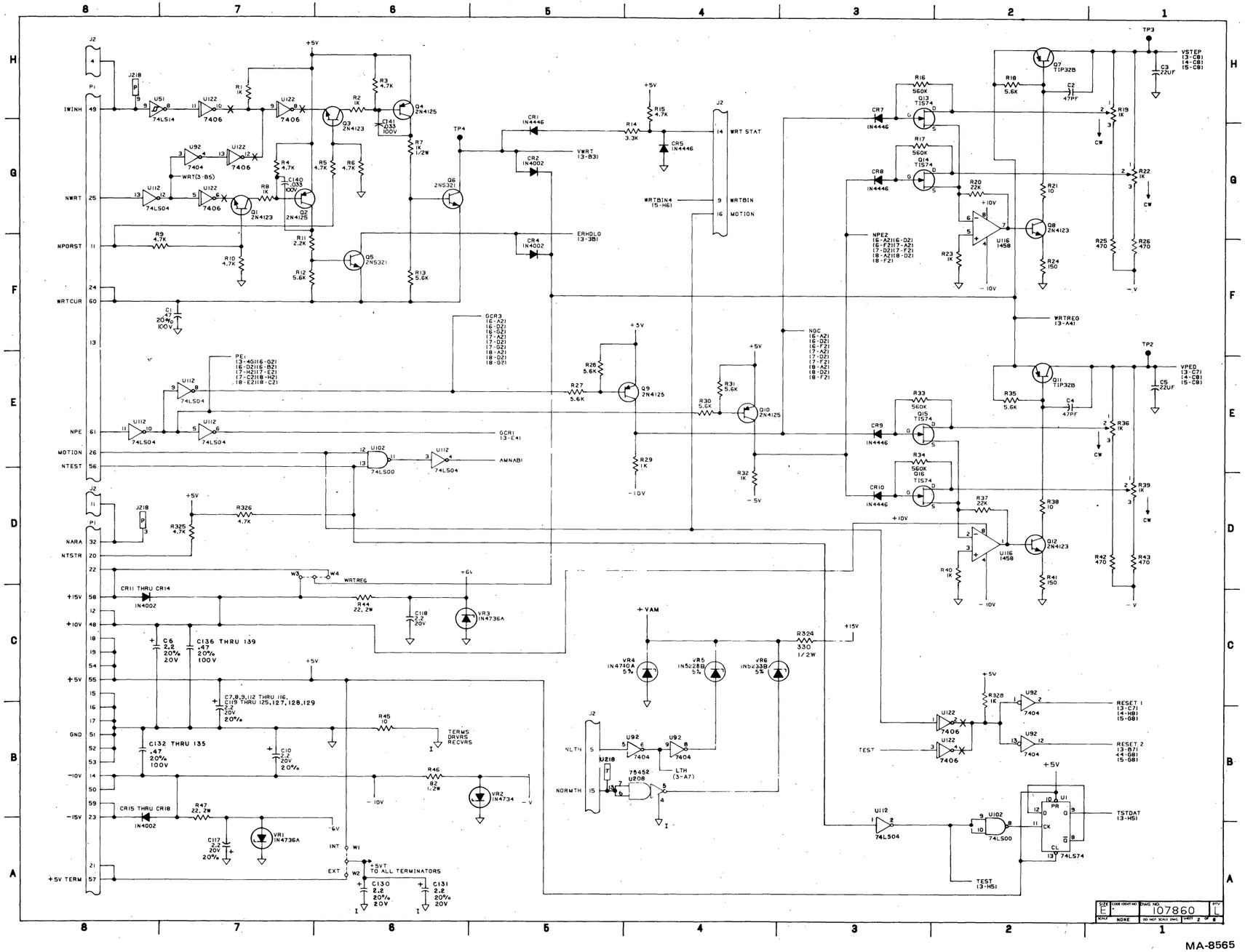
PERTEC a division of Pertec Computer Corporation

TITLE SCHEMATIC, GCR WRITE/PE (125 IPS)

SIZE E | CODE IDENT NO 32097 | DWG NO. 107860 | REV L
SCALE NONE | DO NOT SCALE DWG | SHEET 1 OF 8

MA-8559

Figure 19 Schematic, GCR Write/PE (Sheet 1 of 8)



MA-8565

Figure 19 Schematic, GCR Write/PE (Sheet 2 of 8)

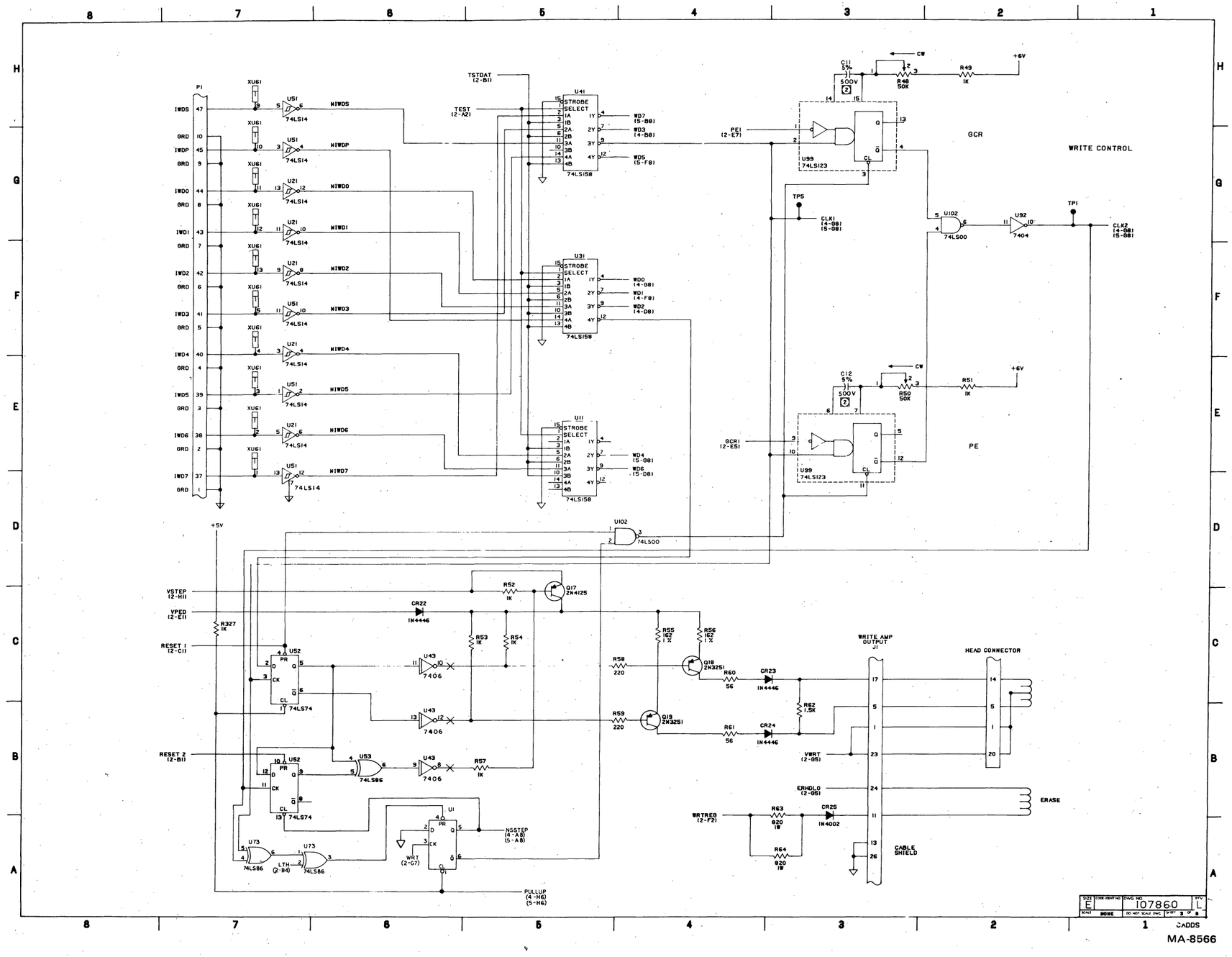


Figure 19 Schematic, GCR Write/PE (Sheet 3 of 8)

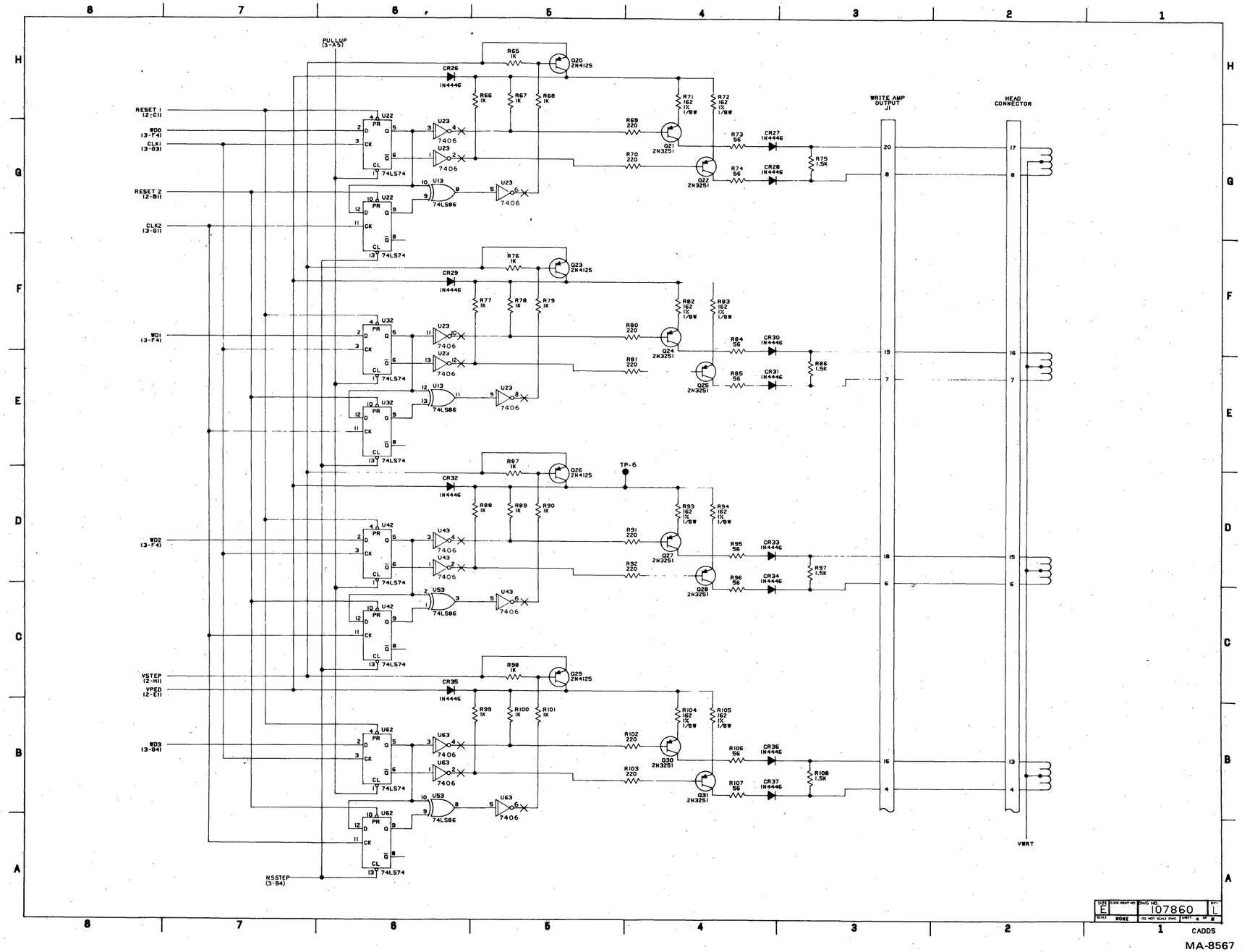


Figure 19 Schematic, GCR Write/PE (Sheet 4 of 8)

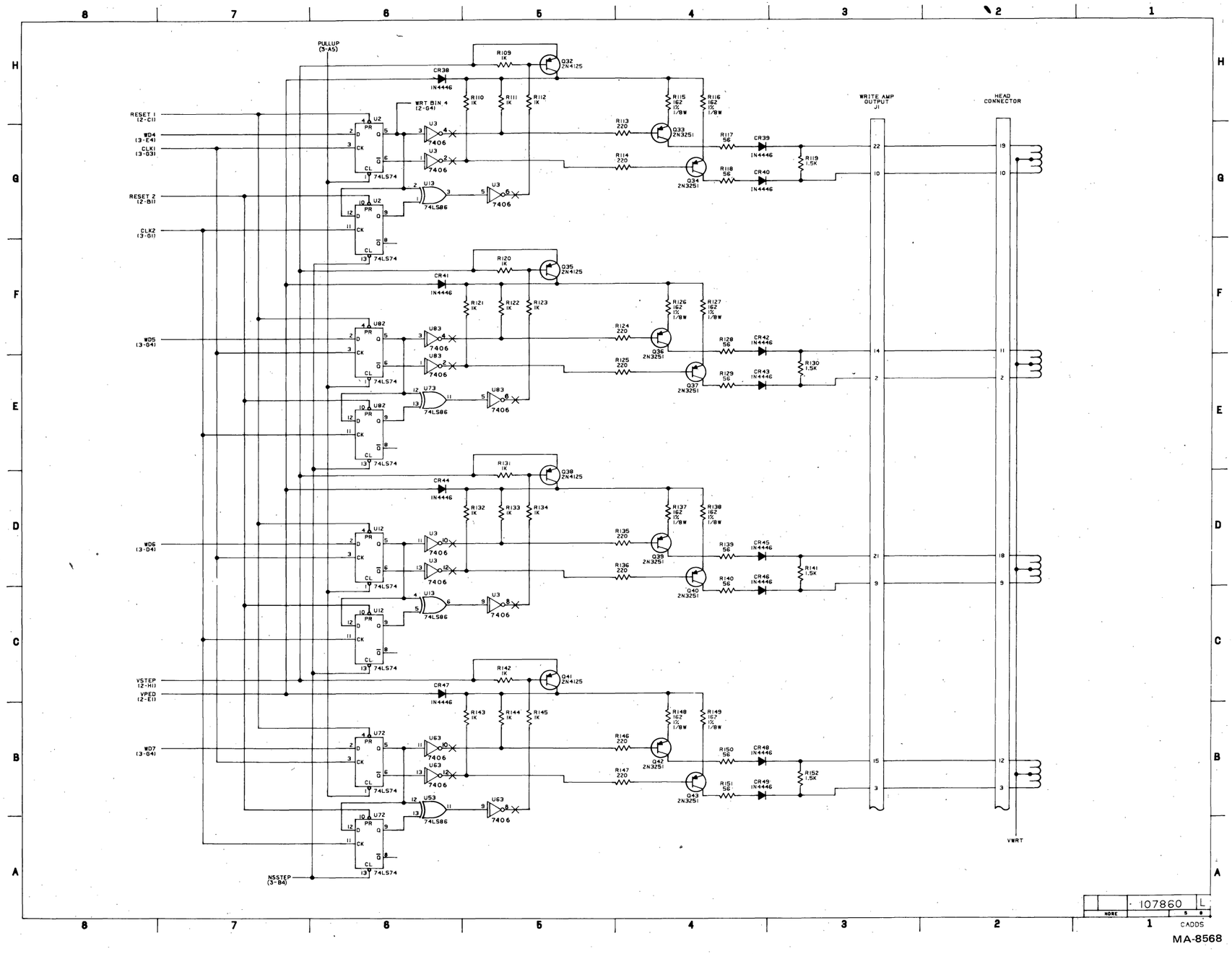


Figure 19 Schematic, GCR Write/PE (Sheet 5 of 8)

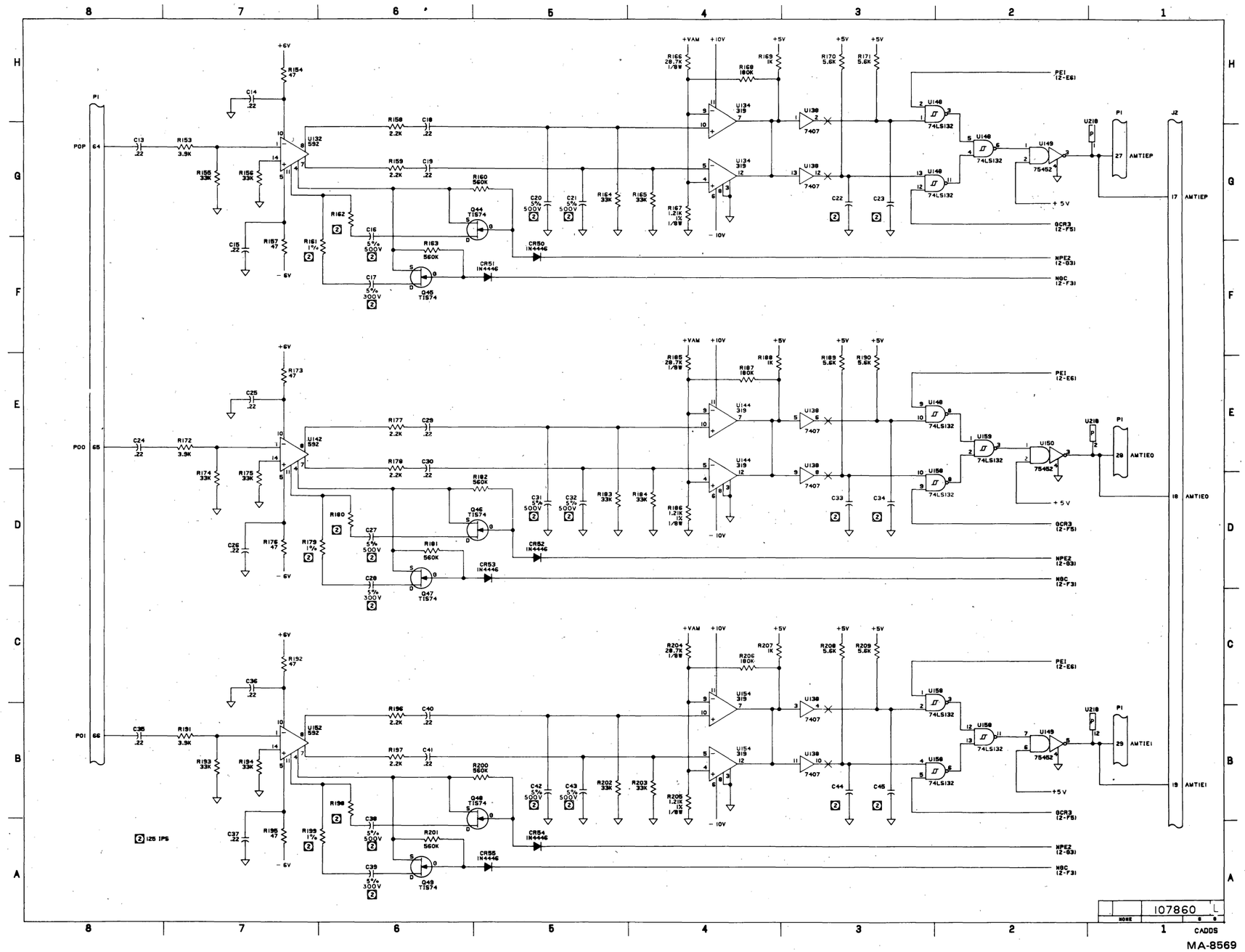


Figure 19 Schematic, GCR Write/PE (Sheet 6 of 8)

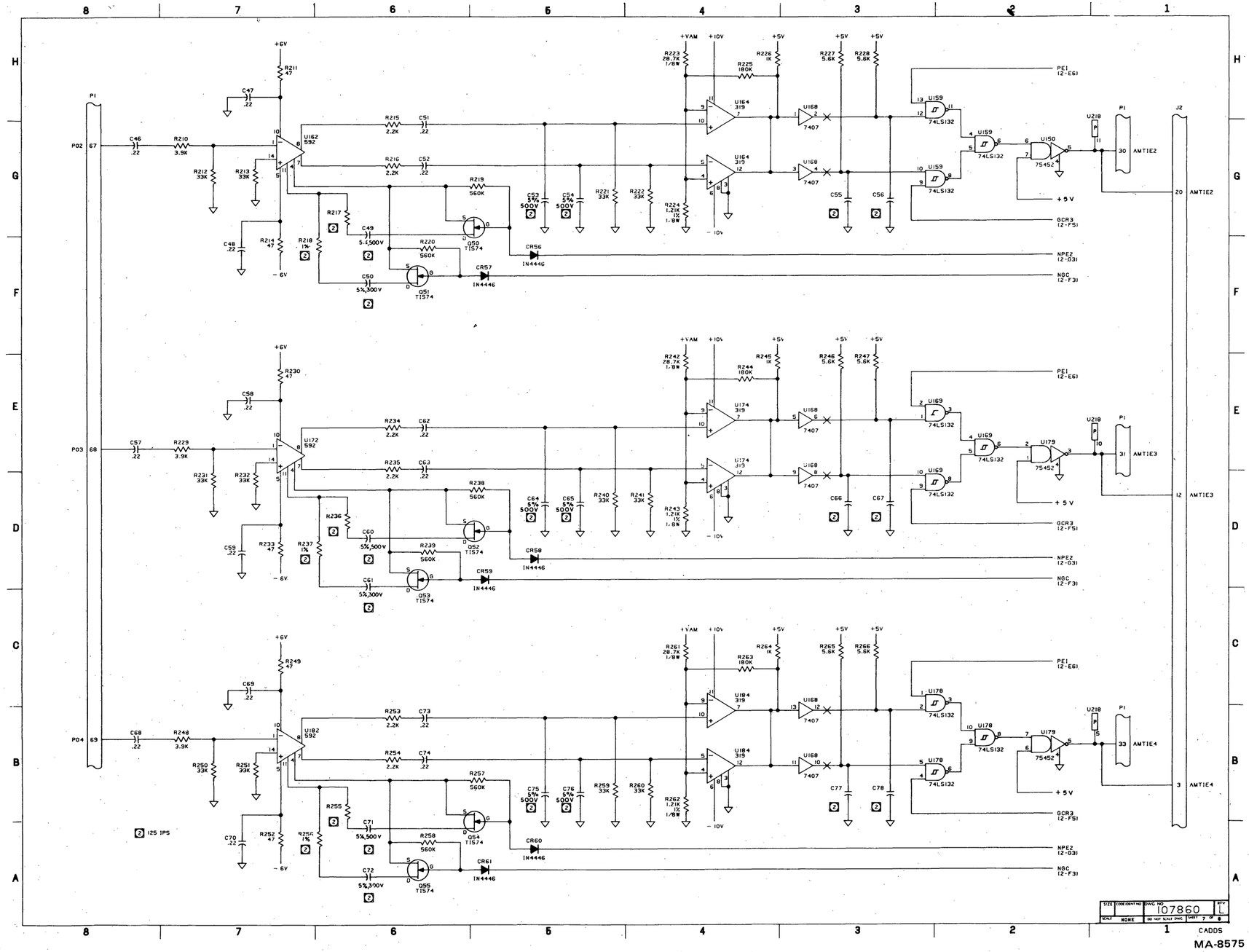


Figure 19 Schematic, GCR Write/PE (Sheet 7 of 8)

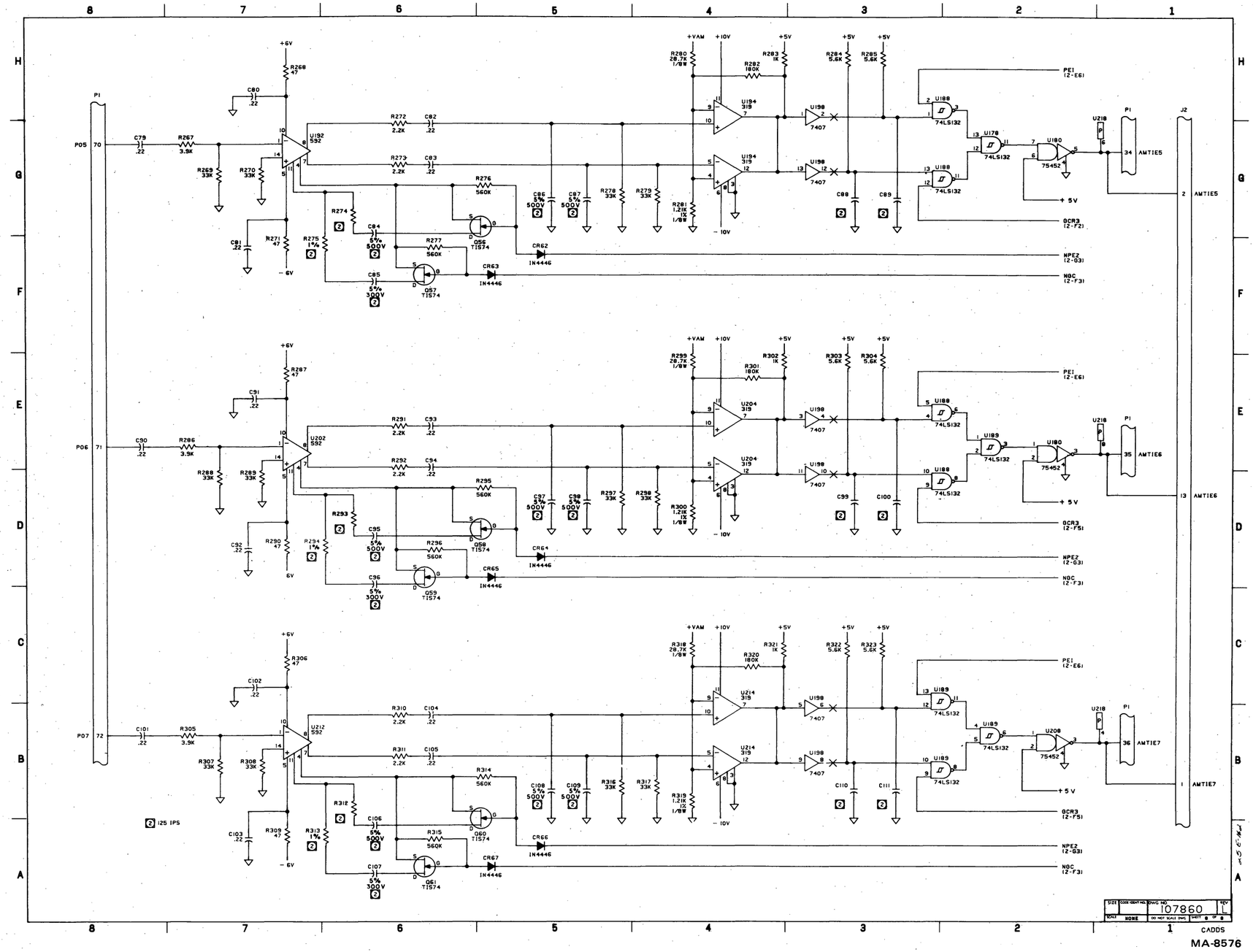


Figure 19 Schematic, GCR Write/PE (Sheet 8 of 8)

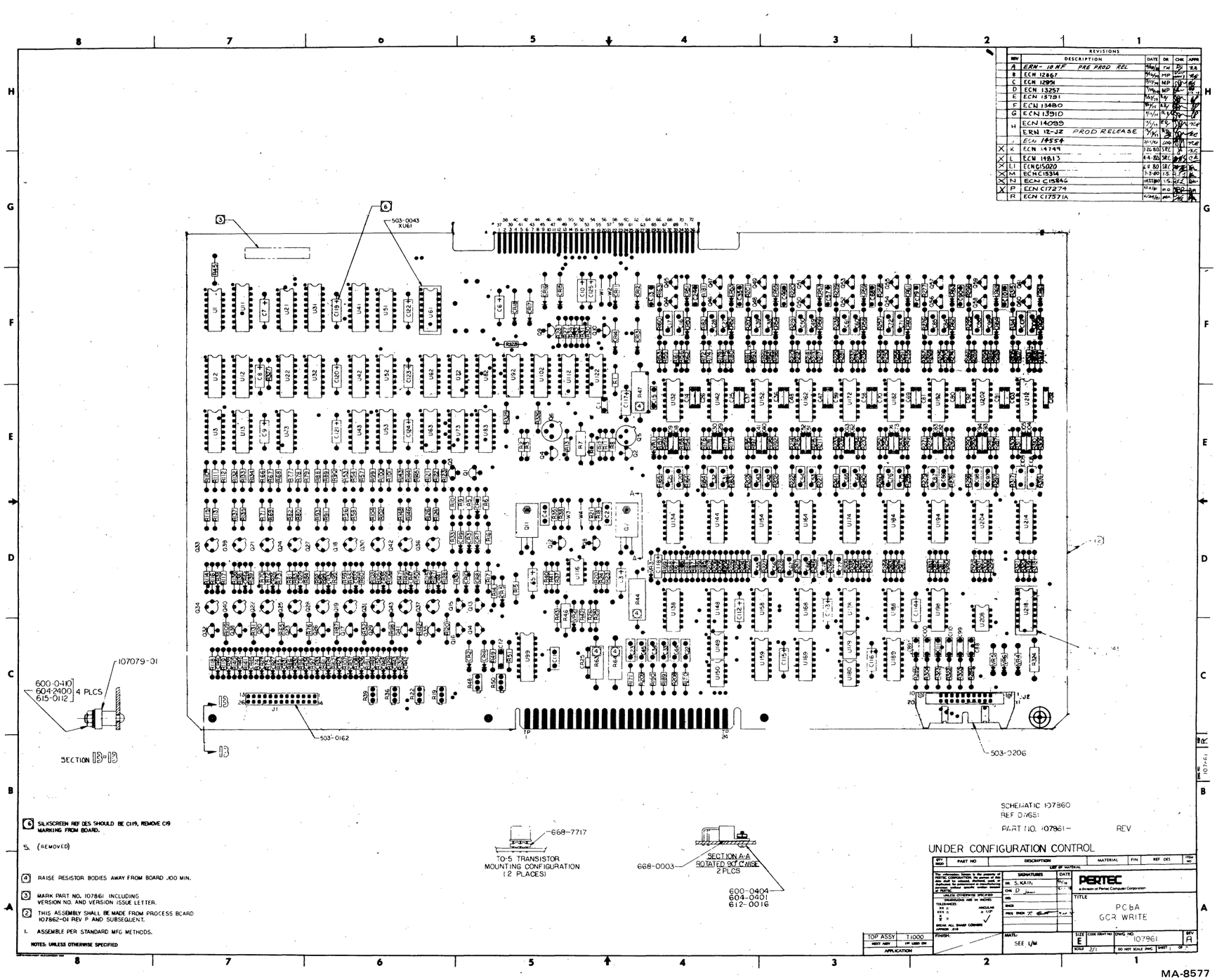


Figure 20 PCBA, GCR Write/PE

REVISIONS

REV	DESCRIPTION	DATE	DR	CHK	APPR
A	ERN 10-TD PRE-PROD RELEASE				
B	ECN 12306A	[illegible]	MP		
C	ECN 12868	[illegible]			
D	ECN 12907	[illegible]			
E	ECN 13487	[illegible]			
F	ECN 13656	[illegible]			
G	ECN 13911	[illegible]			
H	ECN 140[illegible]9	[illegible]			
H	ERN 12-JP PRODUCTION RELEASE	4/7/79			
J	ECN 14264	[illegible]	MA		
K	ECN 14771	[illegible]			
K1	ECN C15020	[illegible]	L.S.		
L	ECN C1[illegible]	[illegible]	L.S.		
M	ECN C15513	[illegible]	SRC		
N	ECN C15434	[illegible]			
P	ECN C14879	[illegible]			
R	ECN C17752	[illegible]	TEM		

TABLE I [1]

PART NO.	REFERENCE DESIGNATION
100-1005	R132,133,146,150,232,233,246,250, 332,333,346,350,432,433,446,450,532,533, 546,550,632,633,646,650,732,733,746,750, 832,833,846,850,932,933,946,950
100-1025	R18,25,37,38,42 148, 248, 348, 448, 548, 648, 748, 848, 948
100-1035	R36
100-1245	R102,202,302,402,502,602,702,802,902
100-2225	R134,135,234,235,334,335,434,435,534, 535,634,635,734,735,834,835,934,935
00-2235	R104,204,304,404,504,604,704,804,904
100-3335	R130,131,230,231,330,331,430,431,530,531, 630,631,730,731,830,831,930,931,34
100-3925	R 40,14,,240,241,340,341,440,441,540,541, 640,641,740,741,840,841,940,941
100 4725	R103,203,303,403,503,603, 703,803,903,48
100-5625	R16,17,19,20,21,22,23,24
100-5645	R138,139,238,239,338,339,438,439,538,539, 638,639,738,739,838,839,938,939
101-1015	R29
101-8205	R 43
103 1005	R28,30,31,44,45,46
107-1472	R 0,210,310,410,510,610,710,810,910
107-1331	R113,213,313,413,513,613,713,813,913
107-2152	R39
107-1961	R107,207,307,407,507,607,707,807,907
107-3831	R108,208,308,408,508,608,708,808,908
107-5622	R40
107-6810	R105,205,305,405,505,605,705,805,905
107-7501	R109,209,309,409,509,609,709,809,909
107-9090	R111,211,311,411,511,611,711,811,911
107-9091	R101,201,301,401,501,601,701,801,901
121-1020	R106,206,306,406,506,606,706,806,906
131-2220	C13
135-2241	C14,17,21,23,101,130,131,134,135,136,137,140,145, 202,201,230,231,234,235,236,237,240,245,302, 301,330,331,334,335,336,337,340,345,402 401, 430,431,434,435,436,437,440,445, 502,501,530, 531,534,535,536,537,540,545,602, 601, 630, 631, 634,635,636,637,640,645, 702, 701, 730, 731, 734, 735,736,737,740,745, 802, 801, 830, 831, 834, 835, 836,837,840,845, 902, 901, 930, 934, 935, 936, 937,940,945, 24 THRU 32, 102
139-2244	C3 THRU 12,15,16,18,19,33
139-3352	C22

TABLE I [1]

PART NO.	REFERENCE DESIGNATION
200-4125	Q5,6
204-0074	Q130,131,230,231,330,331,430,431,530,531, 630,631,730,731,830,831,930,931
300-4002	CR4 THRU 13
300-4446	CR130, 131, 230, 231, 330, 331, 430, 431, 530, 531, 630, 631, 730, 731, 830, 831, 930, 931
330-0515	VR4
330-0565	VR1,3
330-1005	VR5
331-0515	VR2
400-0319	U33,34,35,36,37
400-0555	U24, 25
400-0592	U101,201,301,401,501,601,701,801,901
514-0003	S1
700-0521	U102,202,302,402,502,602,702,802,902
700-4393	U106,206,306,406,506,606,706,806,906
700-5452	U23
700-7416	U107,207,307,407,507,607,707,807,907
710-4393	U30, 105, 205, 305, 405, 605, 705, 805, 905
710-7400	U22,28,29, 104, 204, 304, 404, 504, 604, 704, 804, 904,32
710-7402	U27
710-7404	U15,31
710-7410	U26,21
710-7408	U1,2,3,4,5

TABLE V [5]

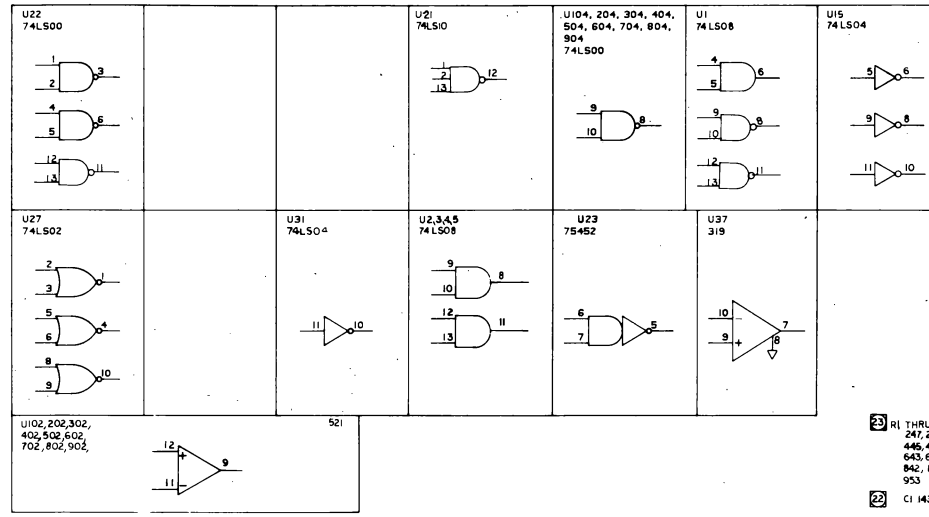


TABLE IV [4]

I.C. TYPE	5V	GND
74LS00	14	7
74LS02	14	7
74LS04	14	7
74LS10	14	7
7416	14	7
74LS08	14	7
74393	14	7
74LS393	14	7
75452	8	4

REFERENCE DESIGNATIONS

LAST USED	NOT USED	DELETED
C946	C34 THRU 100, 103 THRU 129, 147 THRU 200, 203 THRU 229, 247 THRU 300, 303 THRU 329, 347 THRU 400, 403 THRU 429, 447 THRU 500, 503 THRU 529, 547 THRU 600, 603 THRU 629, 647 THRU 700, 703 THRU 729, 747 THRU 800, 803 THRU 829, 847 THRU 900, 903 THRU 929, 2	[22]
CR931	CR14 THRU 100,102 THRU 129, 132 THRU 200, 202 THRU 229, 232 THRU 300, 302 THRU 329, 332 THRU 400, 402 THRU 429, 432 THRU 500, 502 THRU 529, 532 THRU 600, 602 THRU 629, 632 THRU 700, 702 THRU 729, 732 THRU 800, 802 THRU 829, 832 THRU 900, 902 THRU 929	CR 1,2,3,101,201,301, 401,501,601,701,801, 901
Q931	Q8 THRU 129, 132 THRU 229, 232 THRU 329, 332 THRU THRU 429, 432 THRU 529, 532 THRU 629, 632 THRU 729, 732 THRU 829, 832 THRU 929	Q7,1,2,3,4
R953	R47,49 THRU 100, 114 THRU 129, 154 THRU 200, 214 THRU 229, 254 THRU 300, 314 THRU 329, 354 THRU 400, 414 THRU 429, 454 THRU 500, 514 THRU 529, 554 THRU 600, 614 THRU 629, 654 THRU 700, 714 THRU 729, 754 THRU 800, 814 THRU 829, 854 THRU 900, 914 THRU 929	[23]
S1		
TP24	TP3 THRU 9, 12 THRU 19	TP 23,24
U907	U38 THRU 40, 48 THRU 100, 108 THRU 200, 208 THRU 300, 308 THRU 400, 408 THRU 500, 508 THRU 600, 608 THRU 700, 708 THRU 800, 808 THRU 900	[21]
VR5		
W4		W1,2,3,4

TABLE II [2]

ASSEMBLY 107856 VERSION NO.	VERSION CHARACTERISTIC	R136,236,336,436,536, 636,736,836,936		R137,237,337,437,537, 637,737,837,937		C132,232,332,432,532, 632,732,832,932,133, 233,333,433,533,633, 733,833,933,		C138,238,338,438,538, 638,738,838,938	
		VALUE	PART NO.	VALUE	PART NO.	VALUE	PART NO.	VALUE	PART NO.
-01	125 IPS	1.2 K	100-1225	680	100-6815	68 PF	130-6805	100 PF	130-1015

TABLE II [2]

ASSEMBLY 107856 VERSION NO.	VERSION CHARACTERISTIC	C139,239,339,439,539, 639,739,839,939		C141,142,144, 241, 242, 244, 341, 342, 344, 441, 442, 444, 541, 542, 544, 641, 642, 644, 741, 742, 744, 841, 842, 844, 941, 942, 944		C20	
		VALUE	PART NO.	VALUE	PART NO.	VALUE	PART NO.
-01	125 IPS	150 PF	130-1515	33 PF	130-3305	.022	136-2230

[23] R1 THRU 15,26,27,32,33,35,41,112,142,143,144,145,147,149,151,152,153,212,242,243,244,245, 247,249,251,252,253,312,342,343,344,345,347,349,351,352,353,412,442,443,444, 445,447,449,451,452,453,512,542,543,544,545 547,549,551,552,553,612,642, 643,644,645,647,649,651,652,653,712,742,743,744,745,747,749,751,752,753,812, 842,843,844,845,847,849,851,852,853,912,942,943,944,945,947,949,951 952 953

[22] C1 143,146,243,246,343,346,443,446,543,546,643 646 743 746 843 846 943 946

[21] U6 THRU 14,16 THRU 20 41 THRU 47,103,203,303,403,503,603,703,803,903

20. P103 PINS 1,2,7,11,13,14,15,16,18,19,20,21,38,43,46 63,64,65,66, & 71 ARE NOT USED
19. (DELETED)
18. (DELETED)
17. (RESERVED)
16. (RESERVED)
15. (RESERVED)
14. (RESERVED)
13. (RESERVED)
12. RESISTORS WITH 1% TOLERANCE ARE 1/8W.
11. SIGNALS ARE CROSS-REFERENCED BETWEEN SHEETS AND WITHIN A SHEET BY NUMBERS APPEARING UNDER THE ASSOCIATED LOGIC TERM MNEMONIC. THE FIRST NO. IS THE SHEET NO. AND THE SECOND NO. IS THE ZONE NO.
10. (RESERVED)
9. (RESERVED)
8. (RESERVED)
7. CAPACITOR VALUES ARE IN MICROFARADS , 5%, 500V.
6. RESISTOR VALUES ARE IN OHMS , 5%,/1/4W.

[5] FOR SPARE LOGIC ELEMENTS SEE TABLE V.

[4] FOR I.C. GENERIC TYPE NUMBER AND GROUND/VOLTAGE PIN NUMBERS SEE TABLE IV.

3. (RESERVED)

[2] FOR VALUE, PART NUMBER AND USAGE OF COMPONENTS AFFECTED BY VERSION NUMBER, SEE TABLE II.

[1] FOR PART NUMBER OF COMPONENTS NOT AFFECTED BY VERSION NUMBER, SEE TABLE I.

NOTES: UNLESS OTHERWISE SPECIFIED

ASSEMBLY DWG NO. 107856
SPECIFICATION DWG NO.
REFERENCE DRAWING

UNDER CONFIGURATION CONTROL

UNLESS OTHERWISE SPECIFIED

SIGNATURES: DR CADDS

PERTEC a division of Pertec Computer Corporation

TITLE: SCHEMATIC, GCR/PE READ

SIZE E 32097 107855 R

NEXT ASSY / USED ON / APPLICATION / FINISH / MATL

CADDS

MA-8578

Figure 21 Schematic, GCR/PE Read (Sheet 1 of 9)

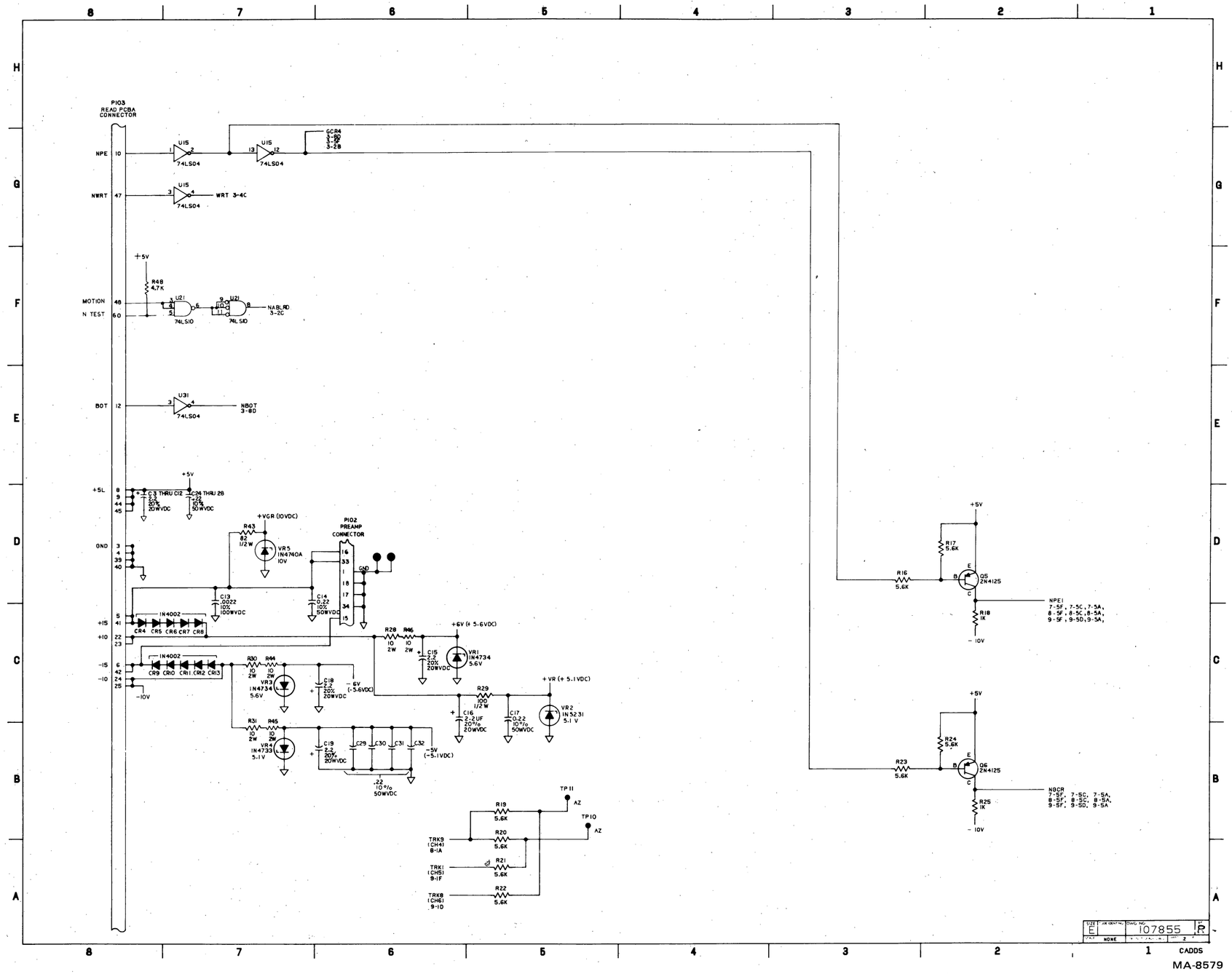


Figure 21 Schematic, GCR/PE Read (Sheet 2 of 9)

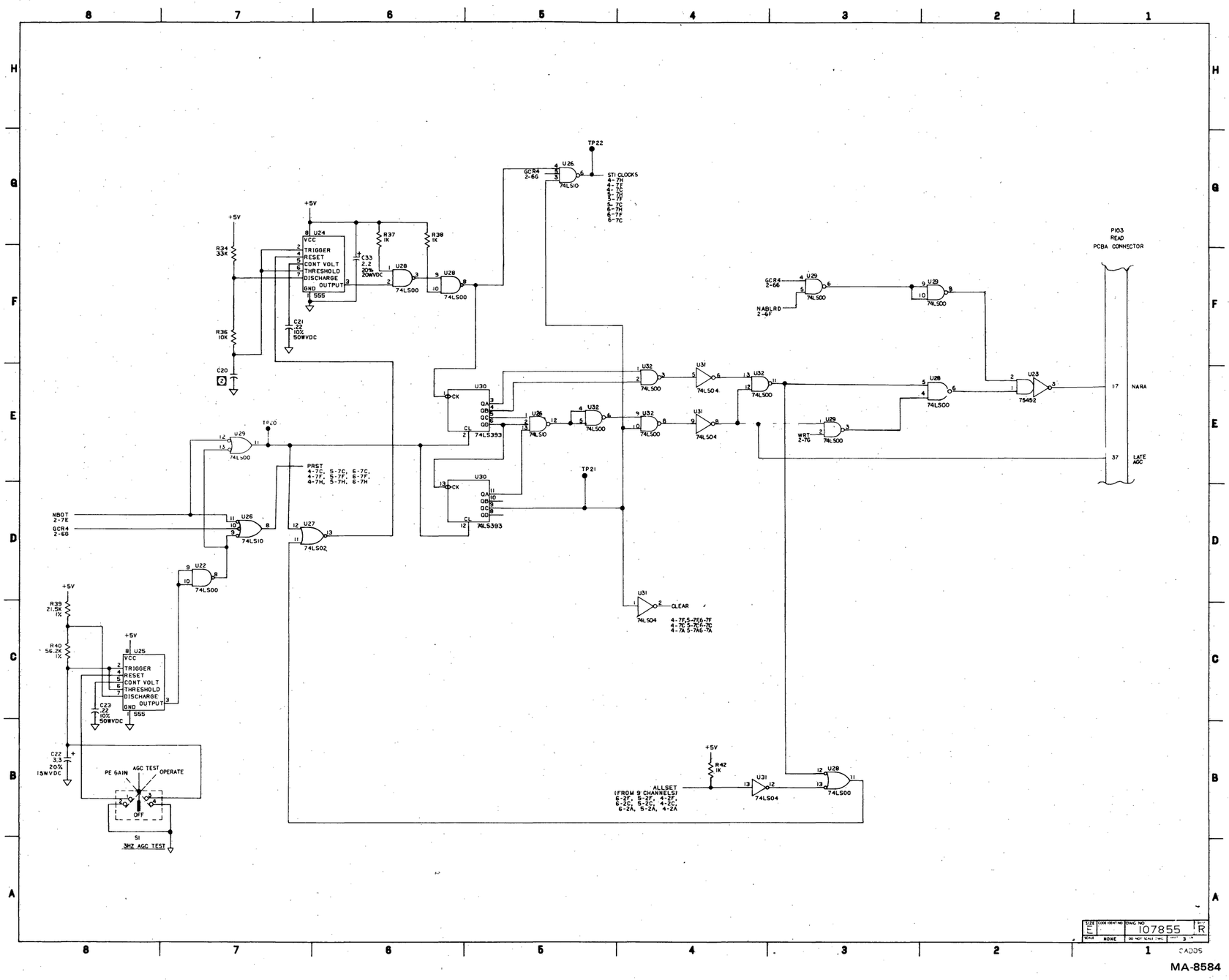


Figure 21 Schematic, GCR/PE Read (Sheet 3 of 9)

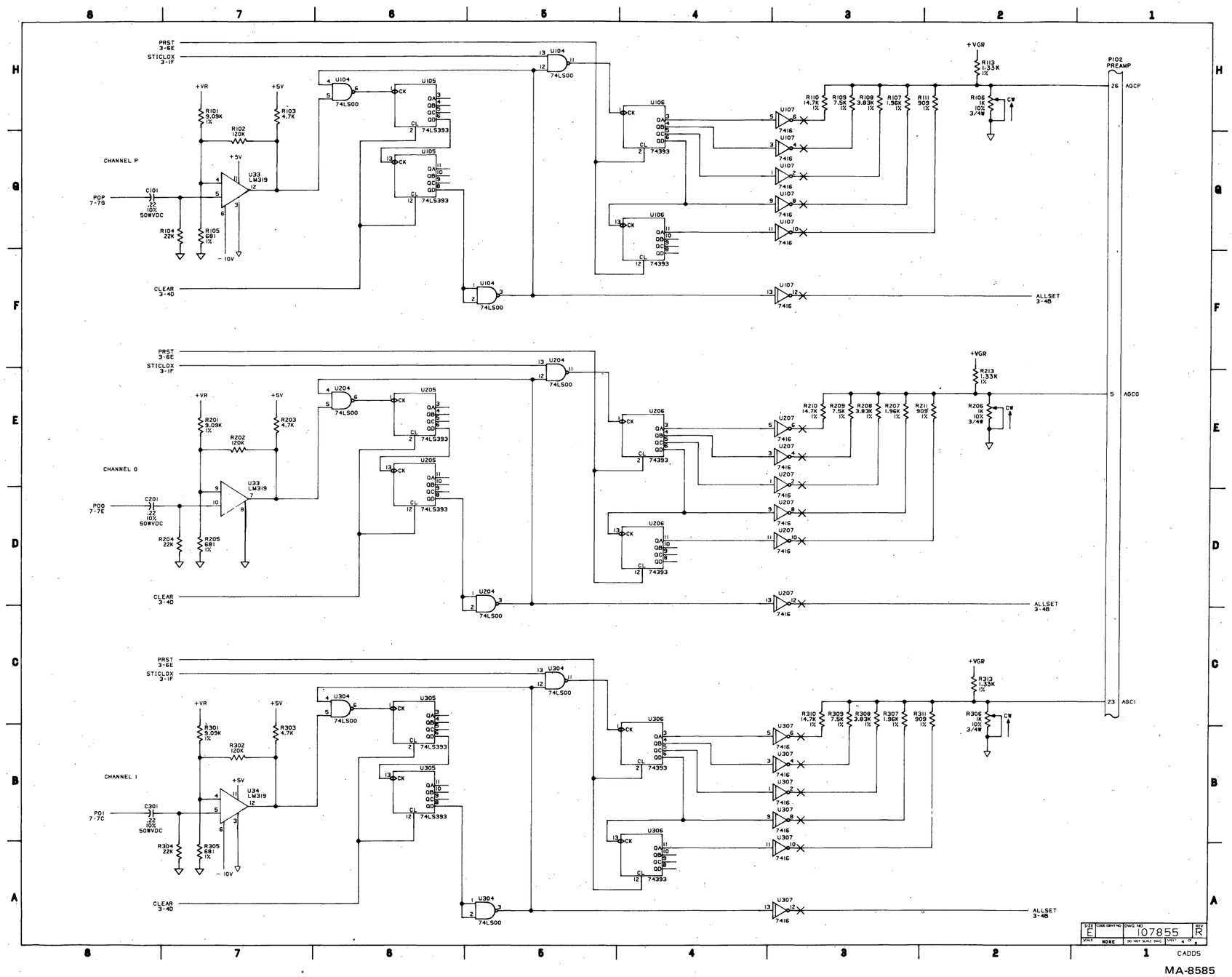


Figure 21 Schematic, GCR/PE Read (Sheet 4 of 9)

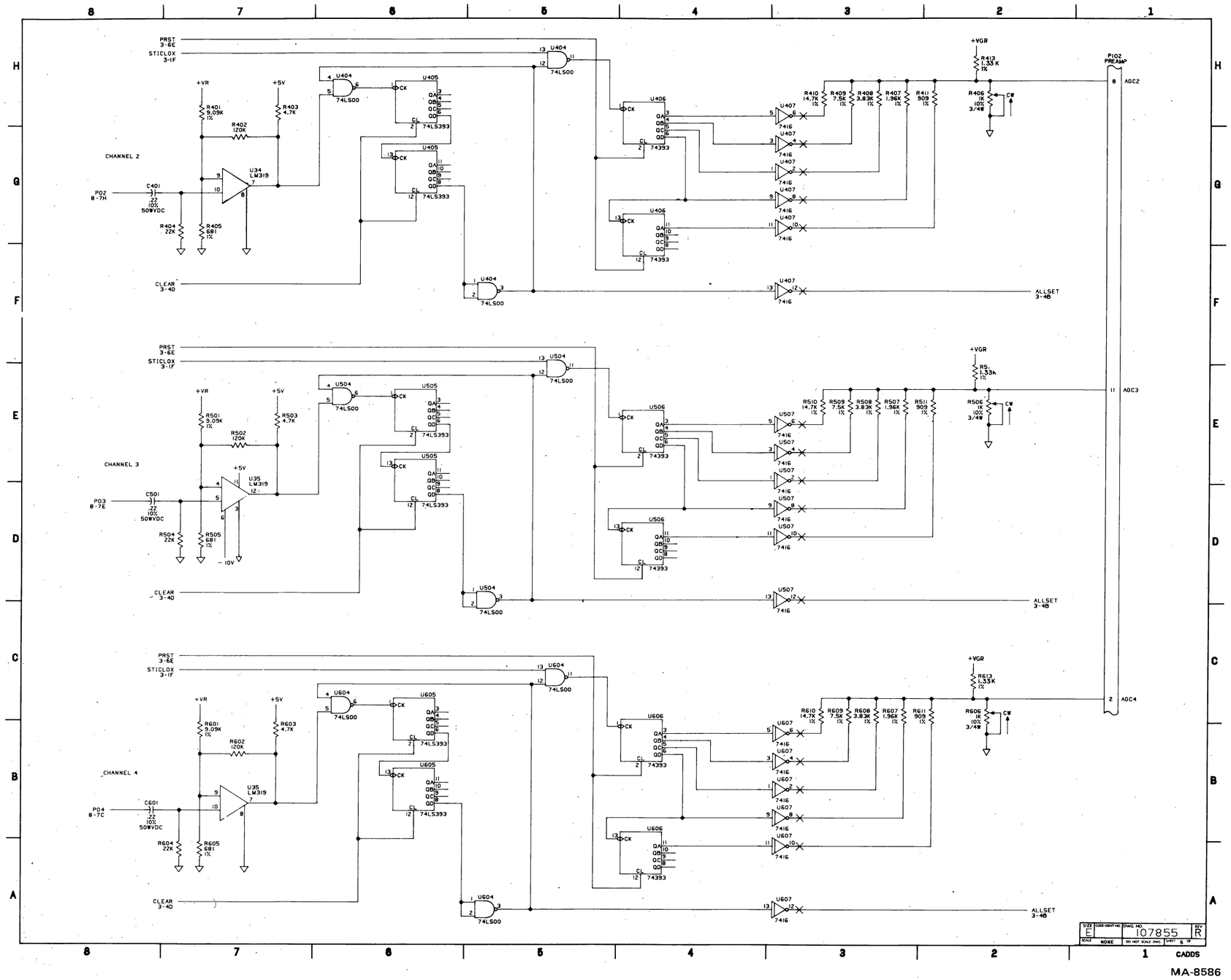


Figure 21 Schematic, GCR/PE Read (Sheet 5 of 9)

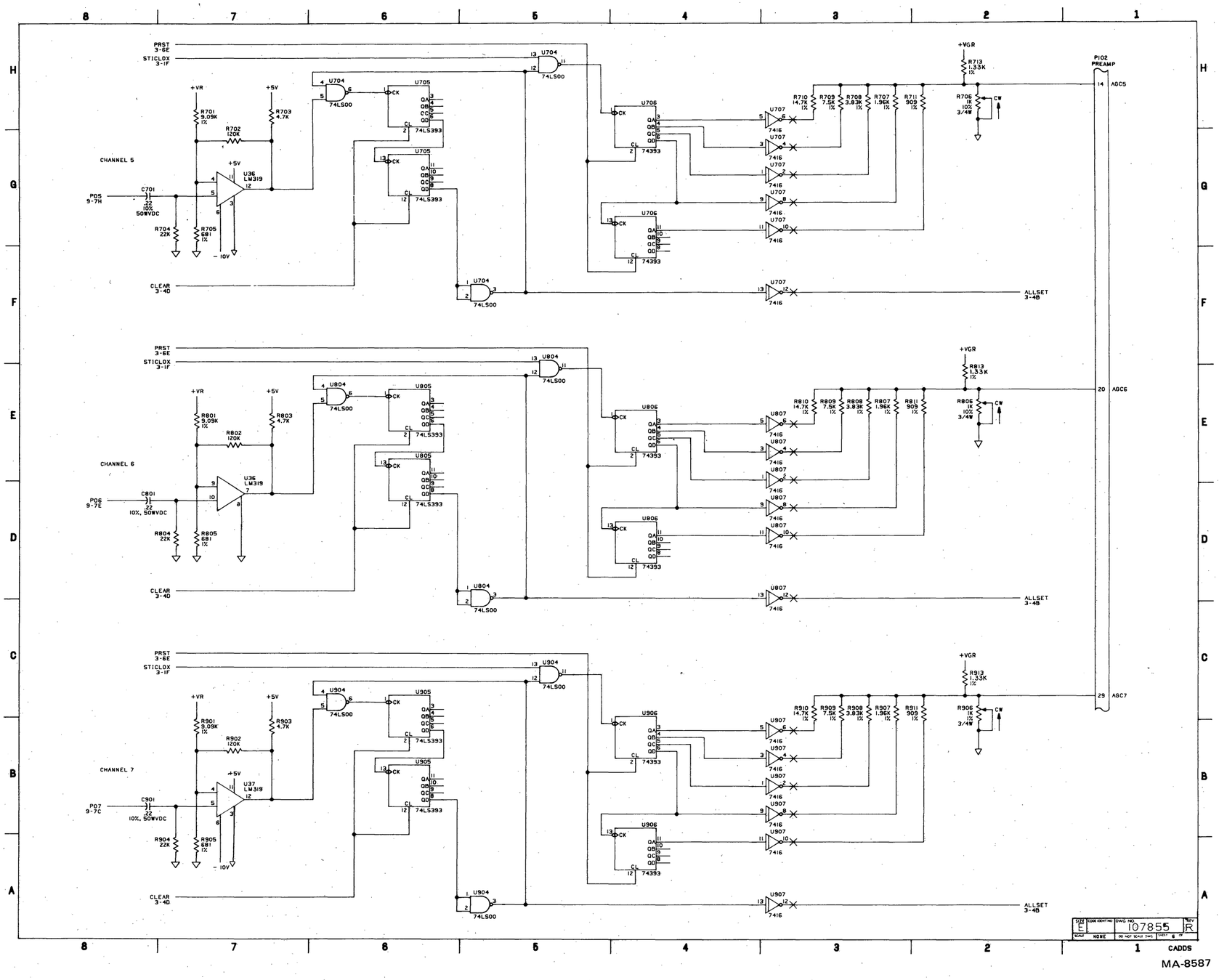


Figure 21 Schematic, GCR/PE Read (Sheet 6 of 9)

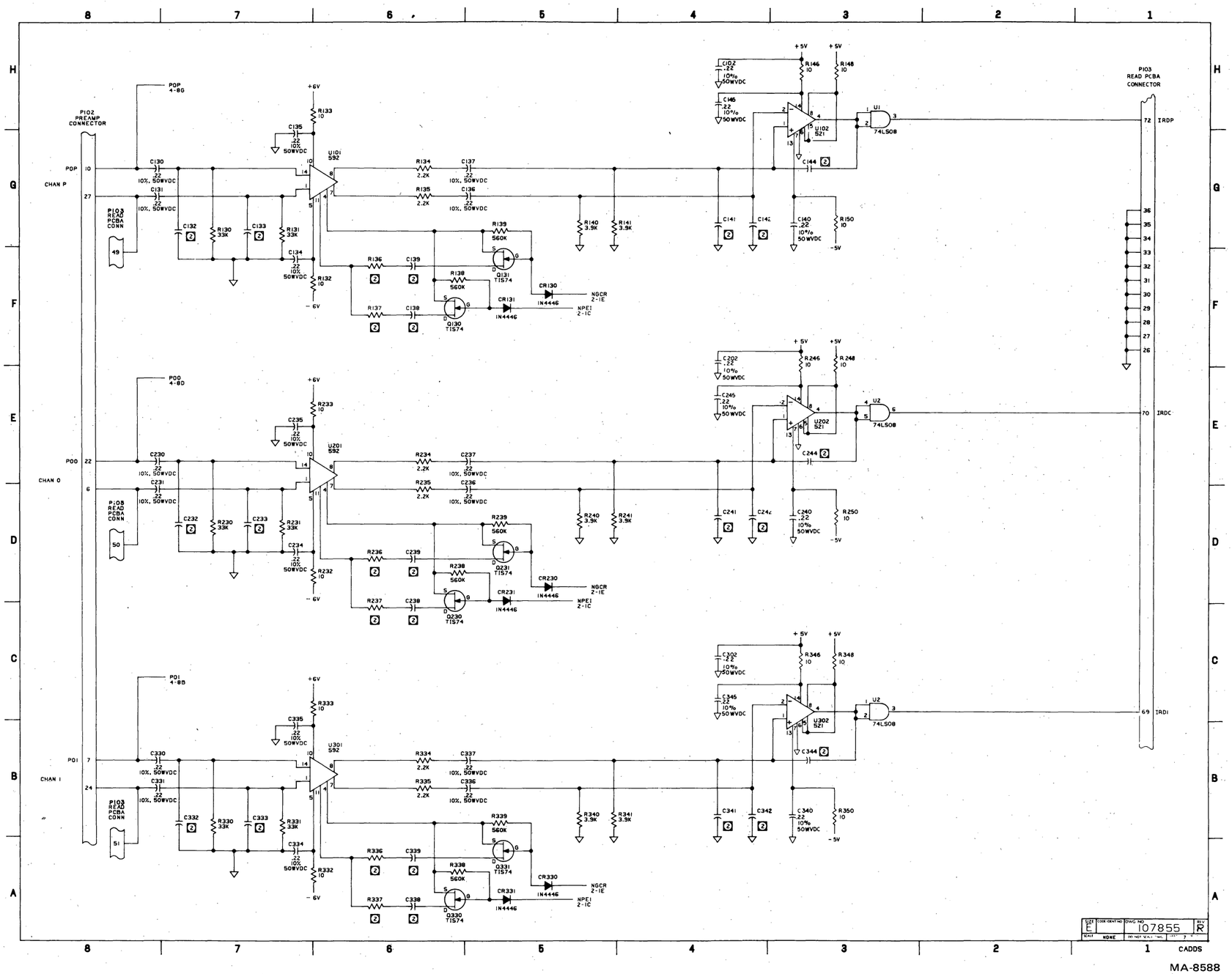


Figure 21 Schematic, GCR/PE Read (Sheet 7 of 9)

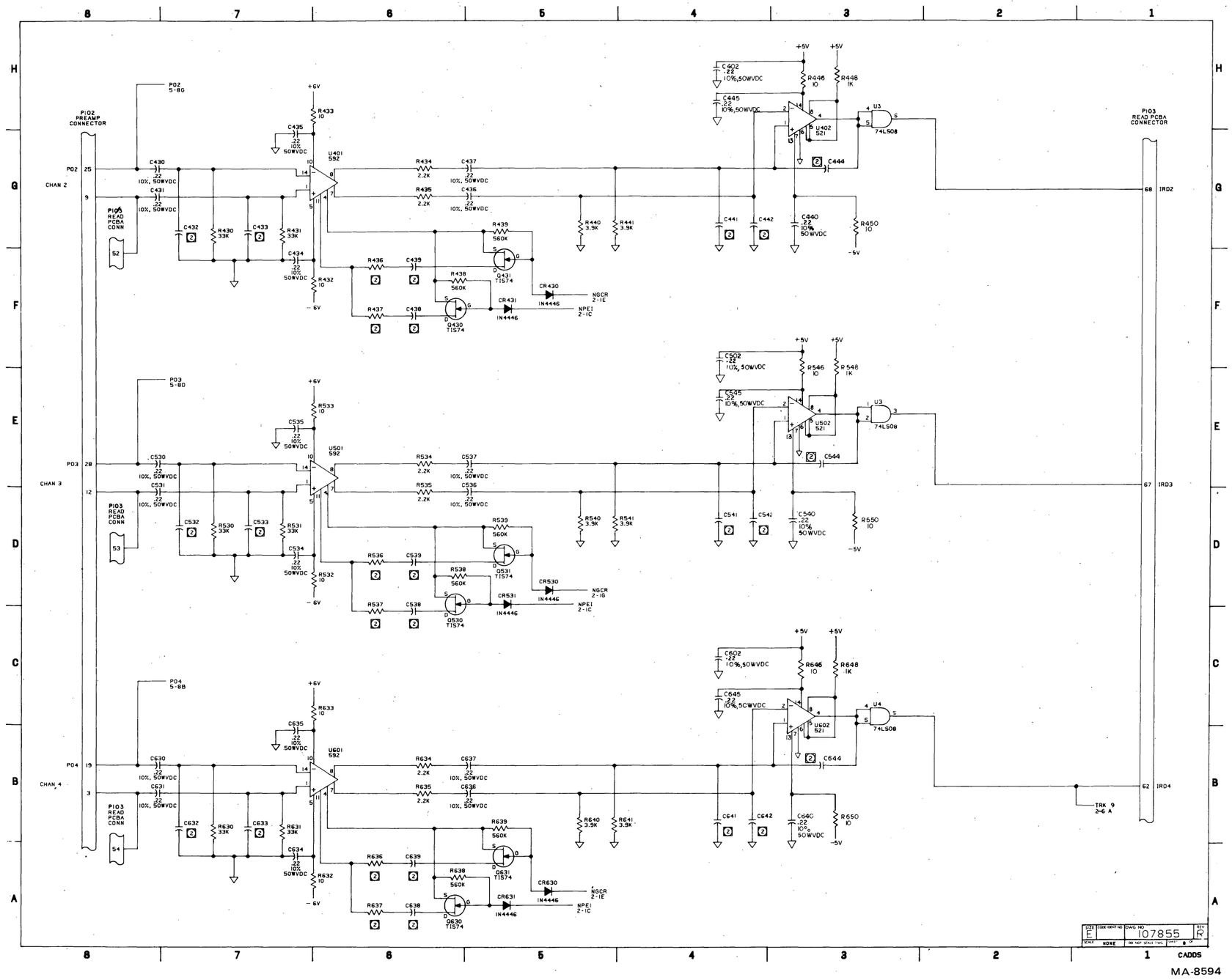


Figure 21 Schematic, GCR/PE Read (Sheet 8 of 9)

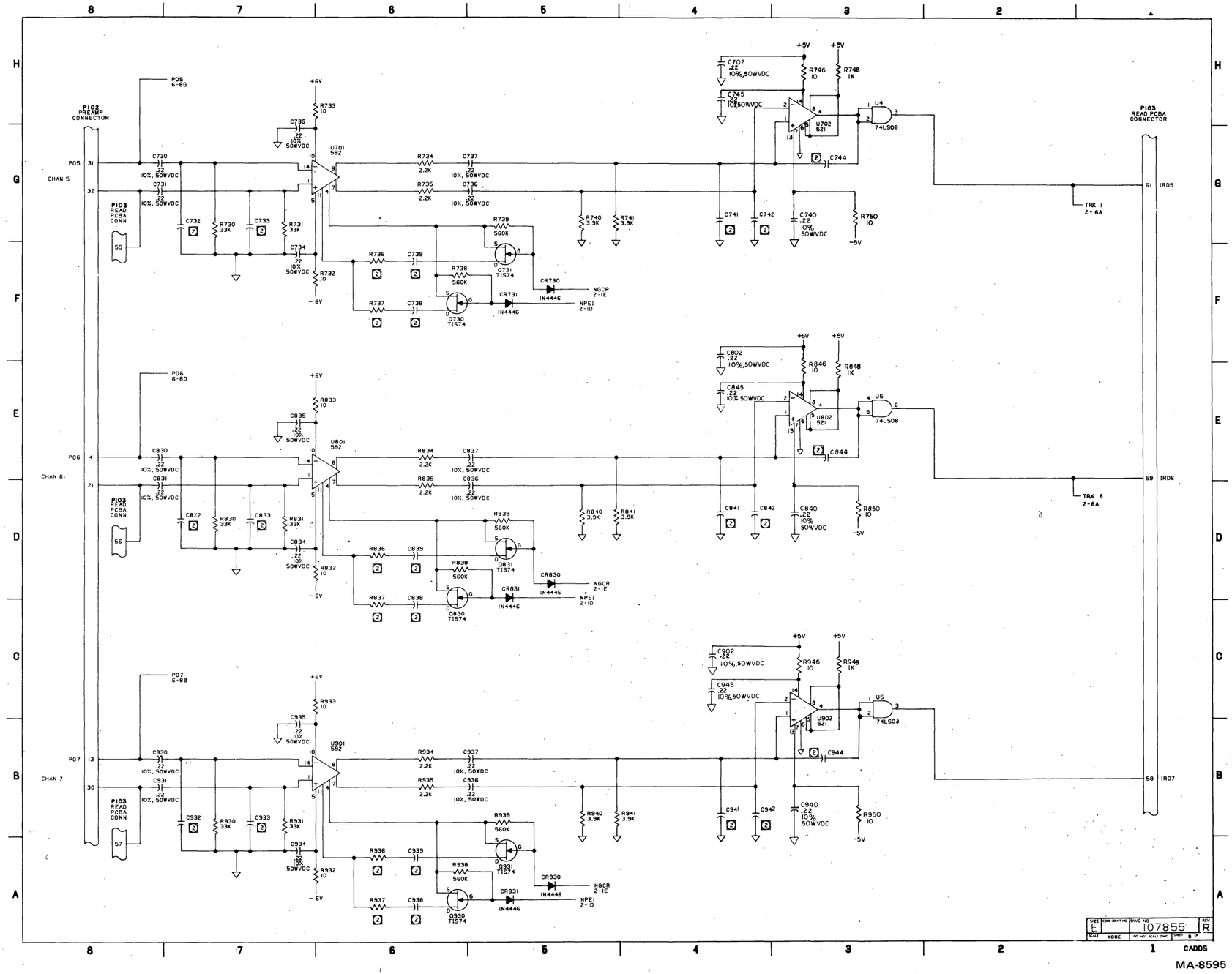
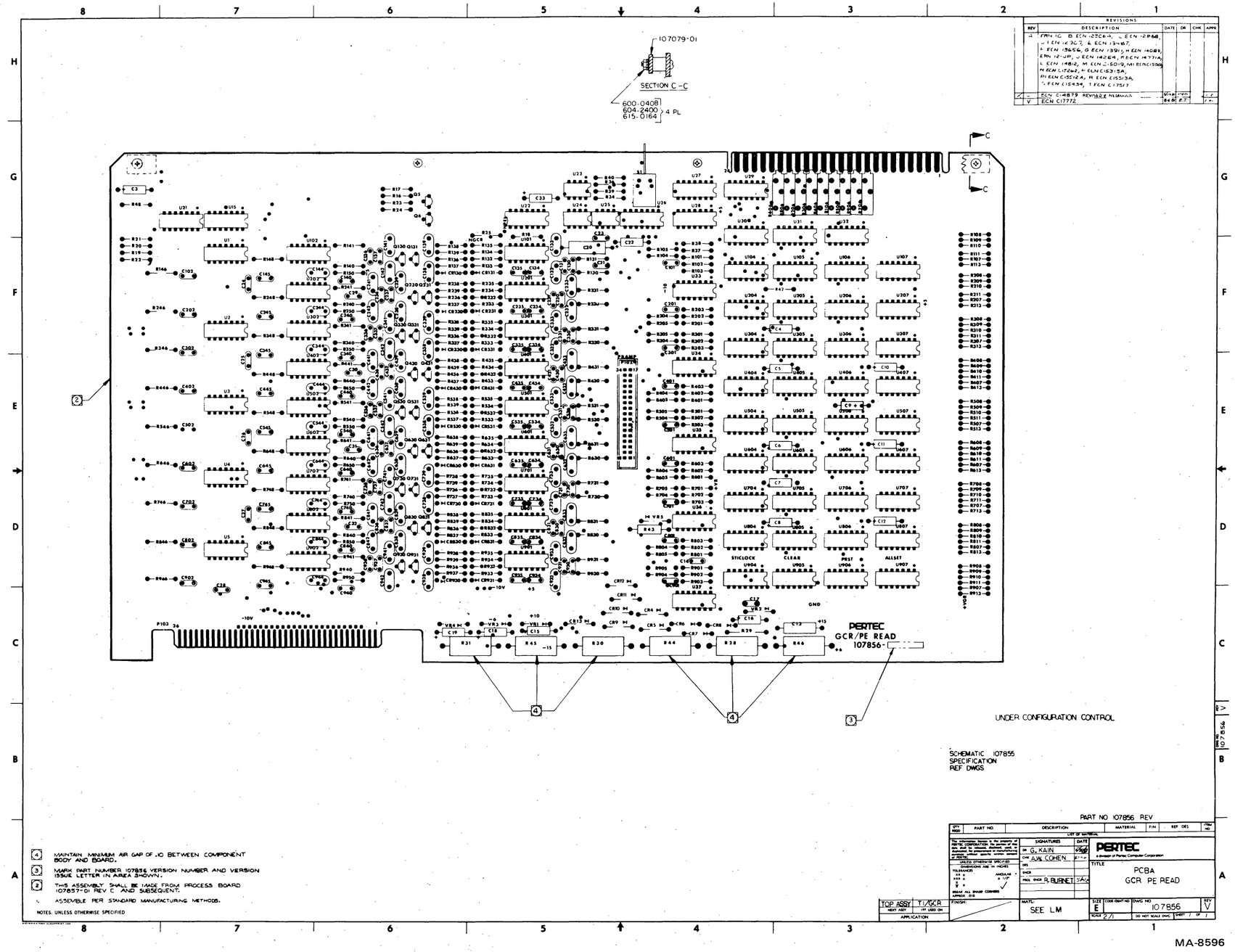


Figure 21 Schematic, GCR/PE Read (Sheet 9 of 9)



4 MAINTAIN MINIMUM AIR GAP OF .10 BETWEEN COMPONENT BODY AND BOARD.

3 MARK PART NUMBER 107856 VERSION NUMBER AND VERSION ISSUE LETTER IN AREA SHOWN.

2 THIS ASSEMBLY SHALL BE MADE FROM PROCESS BOARD 107857-01 REV C AND SUBSEQUENT.

1. ASSEMBLE PER STANDARD MANUFACTURING METHODS.

NOTES: UNLESS OTHERWISE SPECIFIED

Figure 22 PCBA, GCR/PE Read

REVISIONS		
REV	DESCRIPTION	DATE
A	ERN 10 2V PRE-PROD RELEASE	[illegible]
B	ECN 12497	[illegible]
C	ECN 12866	[illegible]
D	ECN 13411	[illegible]
	[illegible] RELEASE	[illegible]
D1	ECN C15025	[illegible]
D2	ECN C15033	7/23/80

TABLE I [1]

PART NO.	REFERENCE DESIGNATION
100-1015	R3,6,9,12,15,18,21,24,27
100-3315	R1,2,4,5,7,8,10,11,13,14,16,17,19,20,22,23,25,26
100-4725	R28 THRU 45
120-0028	U1, 5, 9
120 0033	U3,7,11
135-1031	C3 THRU 10, 16 THRU 23, 29 THRU 36
130-5606	C42 THRU 50
139-2244	C1,2,14,15,27,28
135-4742	C11,12 13,24,25,26,37,38,39,40,41
400-3467	U2,4,6,8,10,12
400-7805	U13
400-7906	U14

REFERENCE DESIGNATIONS

LAST USED	NOT USED	DELETED
C50		
J906		
R45		
U14		
W1		

4. CAPACITOR VALUES ARE IN MICROFARADS, 10%, 100V. POLARIZED CAPACITORS ARE 20%, 20V.
3. RESISTOR VALUES ARE IN OHMS, 1/4W, 5%.
2. PIN 4 OF U1, 3, 5, 7, 9, 11 IS NOT USED.
[1] FOR PART NUMBER OF COMPONENTS NOT AFFECTED BY VERSION NUMBER, SEE TABLE I.

NOTES: UNLESS OTHERWISE SPECIFIED

UNDER CONFIGURATION CONTROL

PERTEC
a division of Pertec Computer Corporation

DR. CADDS

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES: .XX ± .XXX ± ANGULAR ± 1/2°
BREAK ALL SHARP CORNERS APPROX. .010

NEXT ASSY | 1ST USED ON
APPLICATION

FINISH:
MATL:

TITLE SCHEMATIC, GCR/PE PREAMP I

SIZE E | CODE IDENT NO. 32097 | DWG NO. 107870 | REV D2
SCALE NONE | DO NOT SCALE DWG | SHEET 1 OF 2

CADDS

MA-8597

Figure 23 Schematic, GCR/PE Preamp 1 (Sheet 1 of 2)

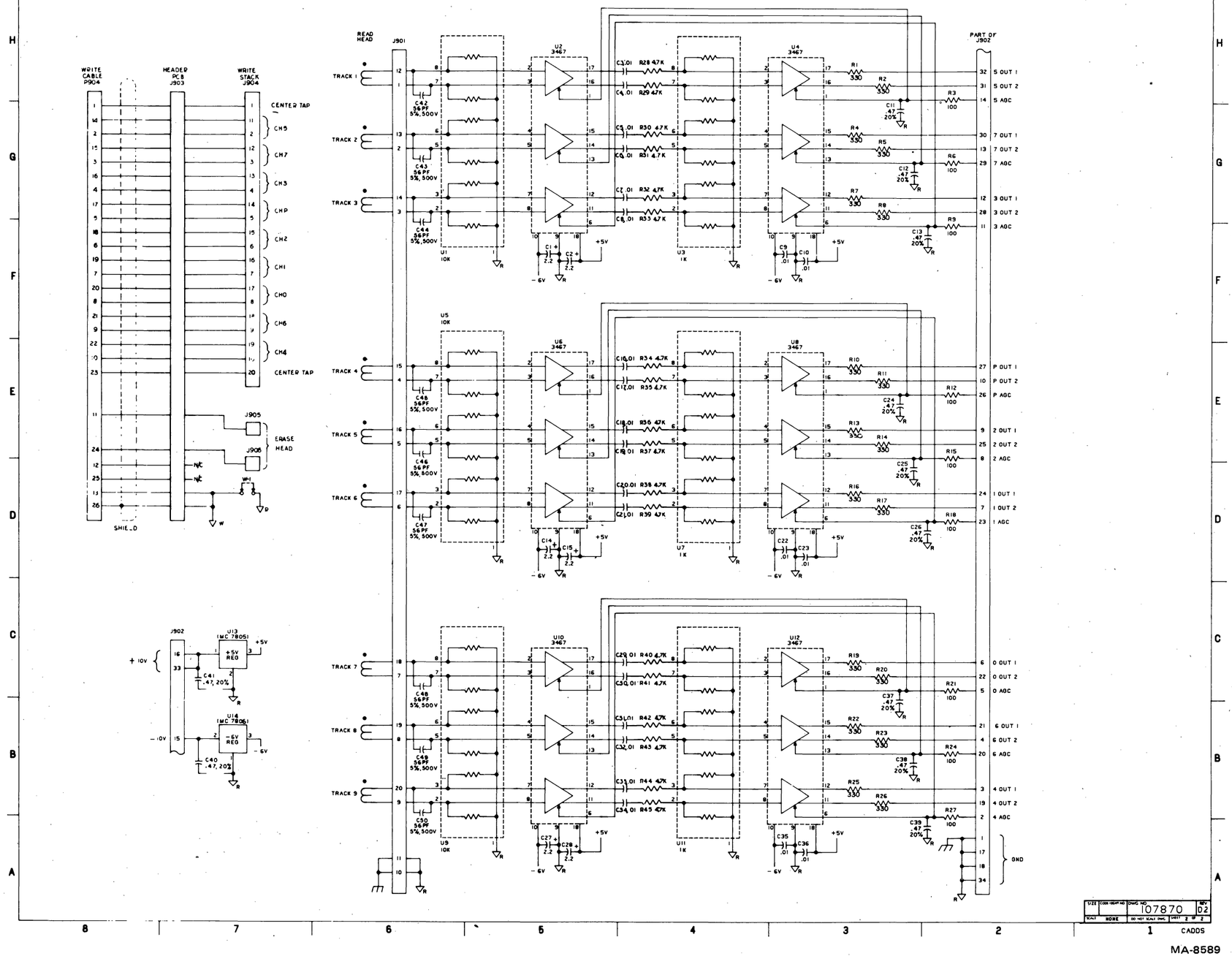


Figure 23 Schematic, GCR/PE Preamp 1 (Sheet 2 of 2)

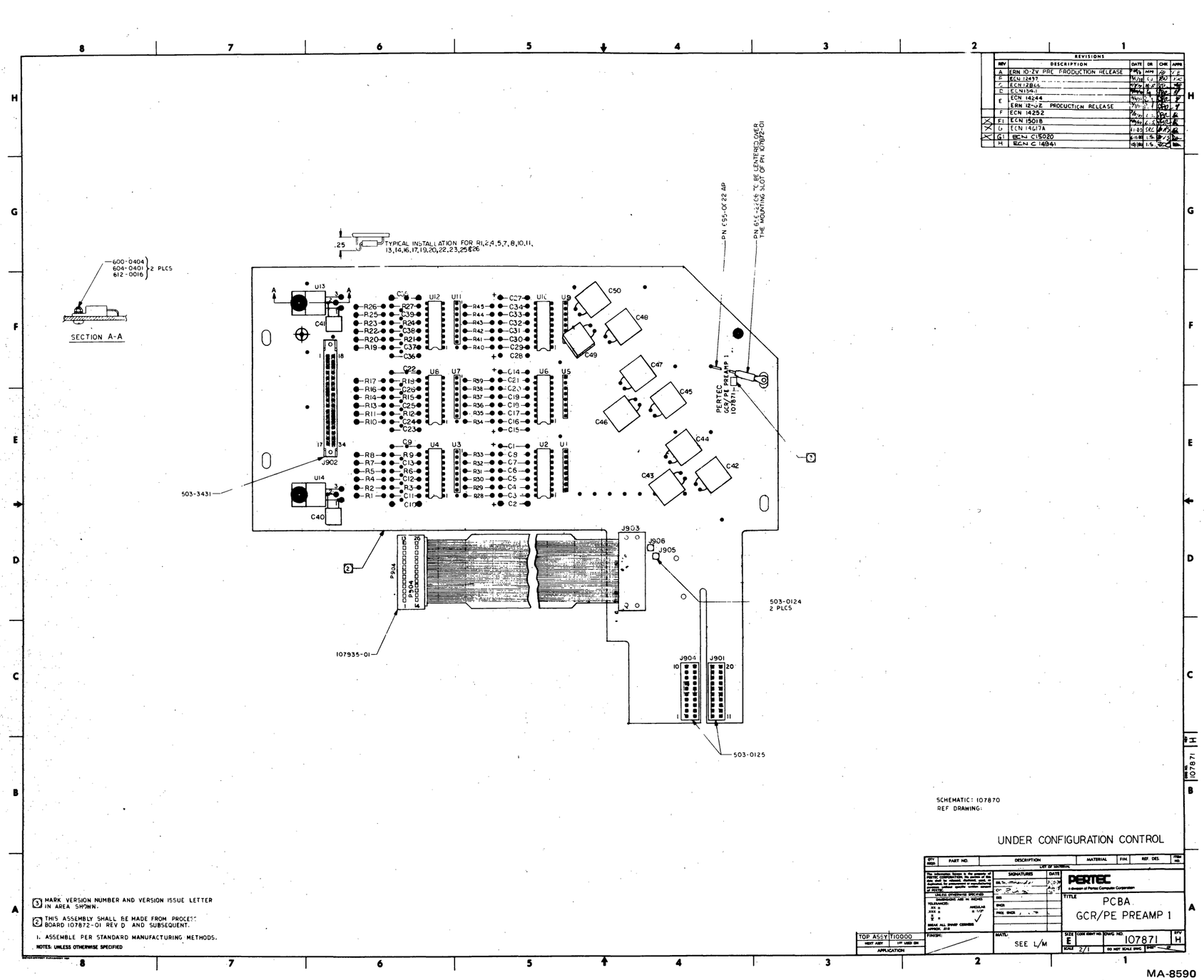


Figure 24 PCBA, GCR/PE Preamp 1

TABLE I (1)

PART NO.	REFERENCE DESIGNATION
100-0005	W1,2
100-1025	R1 THRU 8,11
100-1215	R30
100-2215	R15,17,18,31
100-3315	R13,14
100-3325	R9
100-4715	R16,19,20
107-6811	R10,12,
107-2612	R21 THRU 29
120-0001	U15, 72
120-0003	U115,195
120-0011	U11,71
130-1015	C62,63,64
130-2205	C66,68,70,72,74,76,78,80,82
135-2242	C4 THRU 8,11 THRU 15,18,23,25,28,30, 41,43,46,48 THRU 52,55 THRU 58
135-5070	C61,65,67,69,71,73,75,77,79,81
139-2244	C2,3,9,16,17,19 THRU 22,24,26,27,29,31,32, 33,35,38,39,40,44,45,47,53,54,60
139-6845	C1,59
301-0002	CR1,2
402-2262	Y1
503-0206	J1
503-3432	J2,3
514-0001	S2,3,4
514-0003	S1
514-0009	U125,135,196
700-4158	U184,194
700-4165	U193
700-4180	U74,163
700-5452	U41,42,51,52,61
700-7400	U182
700-7402	U101,155
700-7404	U91,83
700-7414	U62,81,82
700-7416	U92,131,141,152,175
700-7438	U1,2,12,13,21,22,23,31,32,33,111,121,151,154
700-7492	U174
710-4112	U102,132
710-4138	U113,162
710-4161	U185
710-4221	U3,4,45,55,64,122,172
710-4240	U161,181
710-4244	U124,134,144
710-4273	U103
710-4279	U171
710-4373	U93,133,143
710-4374	U84,94,104,114
710-4377	U123,153
710-7400	U164,173,192
710-7404	U73, 142,191
710-7408	U165
710-7414	U5,25,34,54
710-7474	U35,43,53,65,75,112
710-7486	U14,24,44

TABLE V (5)

U5 74LS14 · U12 7438 · U13 7438 · U14 74LS86 · U15 · U25 74LS14 · U34 74LS14 · U54 74LS14 · U64 74LS221

U71 · U72 · U75 74LS74 · U81 7414 · U82 7414 · U91 7404 · U92 7416 · U101 7402

U102 74LS112 · U111 7438 · U112 74LS74 · U131 7416 · U152 7416 · U155 7402 · U11

U171 74LS279 · U172 74LS221 · U175 7416 · U182 7400 · U195 · U154 7438

TABLE IV (4)

REFERENCE DESIGNATION	IC TYPE	+5V	GND
U182	7400	14	7
U164,173,192	74LS00	14	7
U101,155	7402	14	7
U91,83	7404	14	7
U73, 142,191	74LS04	14	7
U165	74LS08	14	7
U62,81,82	7414	14	7
U5,25,34,54	74LS14	14	7
U92,131,141,152,175	7416	14	7
U1,2,12,13,21,22,23,31,32,33,111,121,151,154	7438	14	7
U35,43,53,65,75,112	74LS74	14	7
U14,24,44	74LS86	14	7
U174	7492	5	10
U102,132	74LS112	16	8
U113,162	74LS138	16	8
U184,194	74158	16	8
U185	74LS161	16	8
U193	74165	16	8
U74,163	74180	14	7
U3,4,45,55,64,122,172	74LS221	16	8
U161,181	74LS240	20	10
U124,134,144	74LS244	20	10
U103	74LS273	20	10
U171	74LS279	16	8
U93,133,143	74LS373	20	10
U84,94,104,114	74LS374	20	10
U123,153	74LS377	20	10
U41,42,51,52,61	75452	8	4

REFERENCE DESIGNATIONS

LAST USED	NOT USED	DELETED
C82	C10,34,36,37,42	
CR2		
R31		
S4		
U196	U6 THRU 10,16 THRU 20,26 THRU 30,36 THRU 40, 46 THRU 50,56 THRU 60,66 THRU 70,76 THRU 80, 85 THRU 90,95 THRU 100,105 THRU 110,116 THRU 120, 126 THRU 130,136 THRU 140,145 THRU 150,156 THRU 160, 166 THRU 170,176 THRU 180,186 THRU 190	U63,183
Y1		

11. SIGNALS ARE CROSS-REFERENCED BETWEEN SHEETS AND WITHIN A SHEET BY NUMBERS APPEARING UNDER THE ASSOCIATED LOGIC TERM MNEMONIC. THE FIRST NO. IS THE SHEET NO. AND THE SECOND NO. IS THE ZONE NO.
10. (RESERVED)
9. (RESERVED)
8. (RESERVED)
7. CAPACITOR VALUES ARE IN MICROFARADS, +80% −20%, 50V.
6. RESISTOR VALUES ARE IN OHMS, 5%, 1/4W.
5. FOR SPARE LOGIC ELEMENTS SEE TABLE V.
4. FOR I.C. GENERIC TYPE NUMBER AND GROUND/VOLTAGE PIN NUMBERS SEE TABLE IV.
3. (RESERVED)
2. (RESERVED)
1. FOR PART NUMBER OF COMPONENTS NOT AFFECTED BY VERSION NUMBER, SEE TABLE I.

NOTES: UNLESS OTHERWISE SPECIFIED

SPECIFICATION: 107887
PCBA: 107886
REF DWGS:

UNDER CONFIGURATION CONTROL

REVISIONS					
REV	DESCRIPTION	DATE	DR	CHK	APPR
A	ECN 12-DY PROD RELEASE				
B	ECN 14754				
B1	ECN C15020				
C	ECN C15673				
D	ECN C17943				

SIGNATURES	DATE
DR / CADDS	
CHK R.L.S	
DES L. WERTS	
ENGR	
PROJ ENGR	

PERTEC — A DIVISION OF PERTEC COMPUTER CORPORATION

TITLE: SCHEMATIC, M.I.A. I

107886	T1940-96	FINISH:	MATL:
NEXT ASSY	HT USED ON		
APPLICATION			

SIZE E | DOME DRAWING NO. 32097 | DWG NO. 107885 | REV D
SCALE NONE | DO NOT SCALE DWG | SHEET 1 OF 4

CADDS

MA-8598

Figure 25 Schematic, MIA (Sheet 1 of 4)

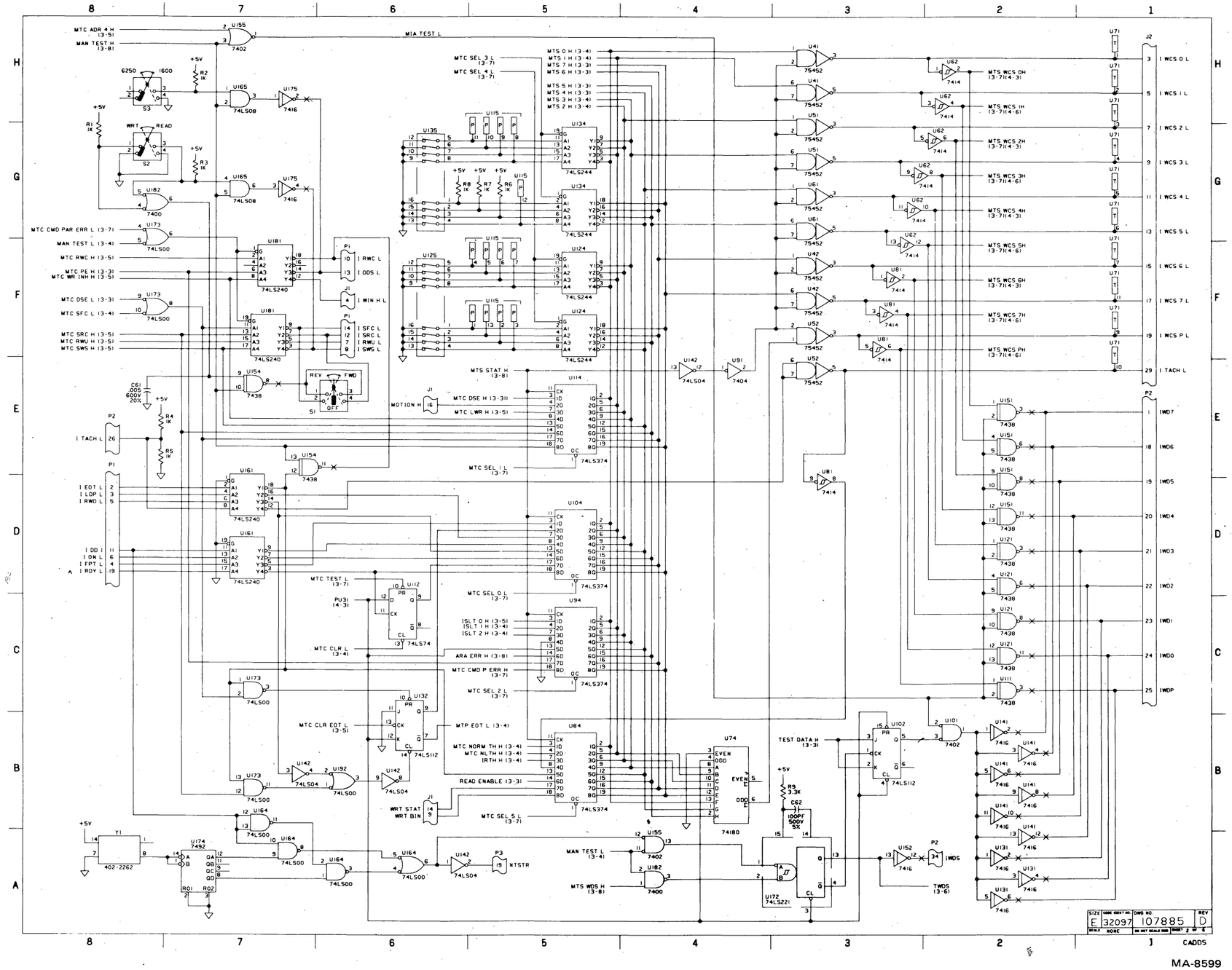


Figure 25 Schematic, MIA (Sheet 2 of 4)

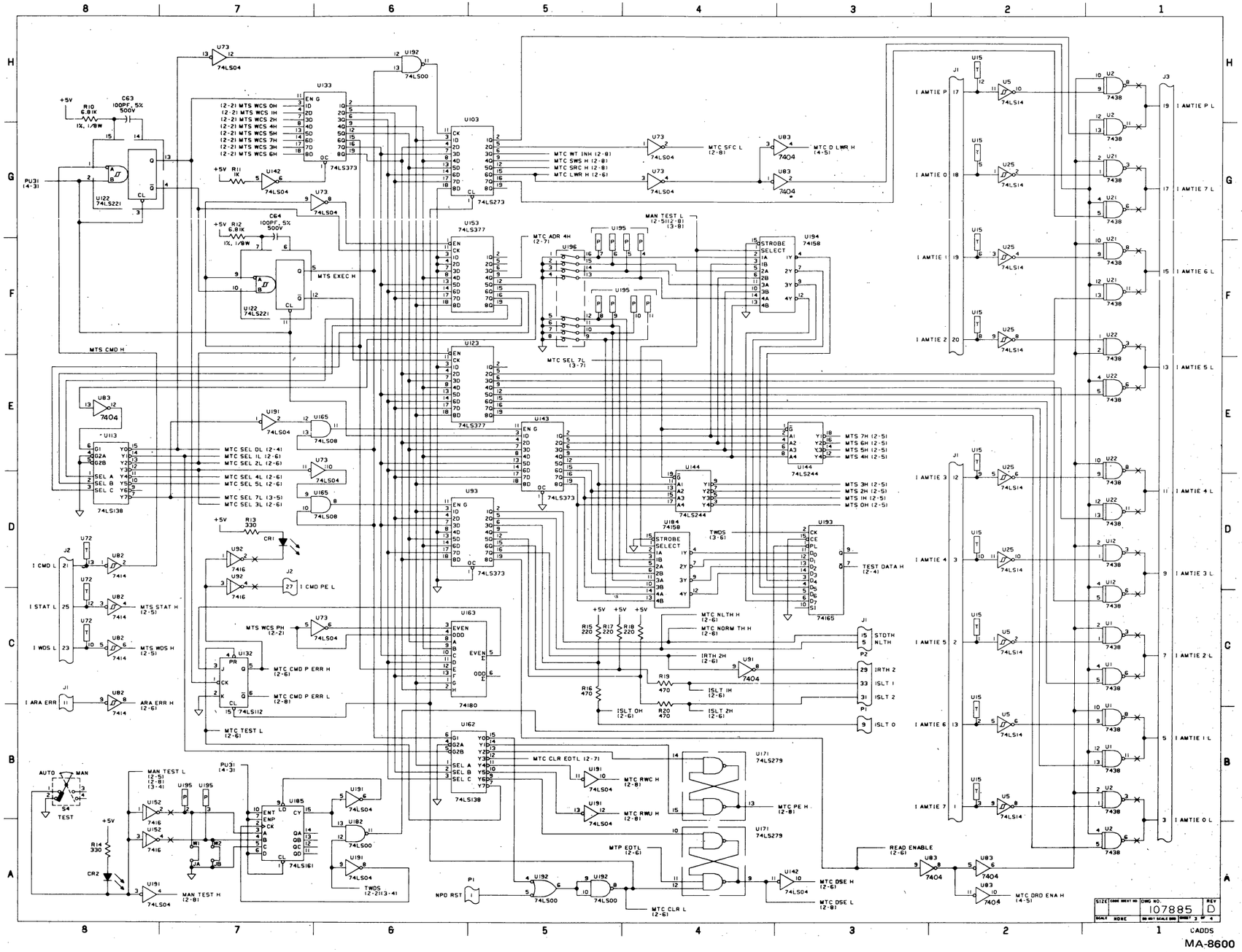


Figure 25 Schematic, MIA (Sheet 3 of 4)

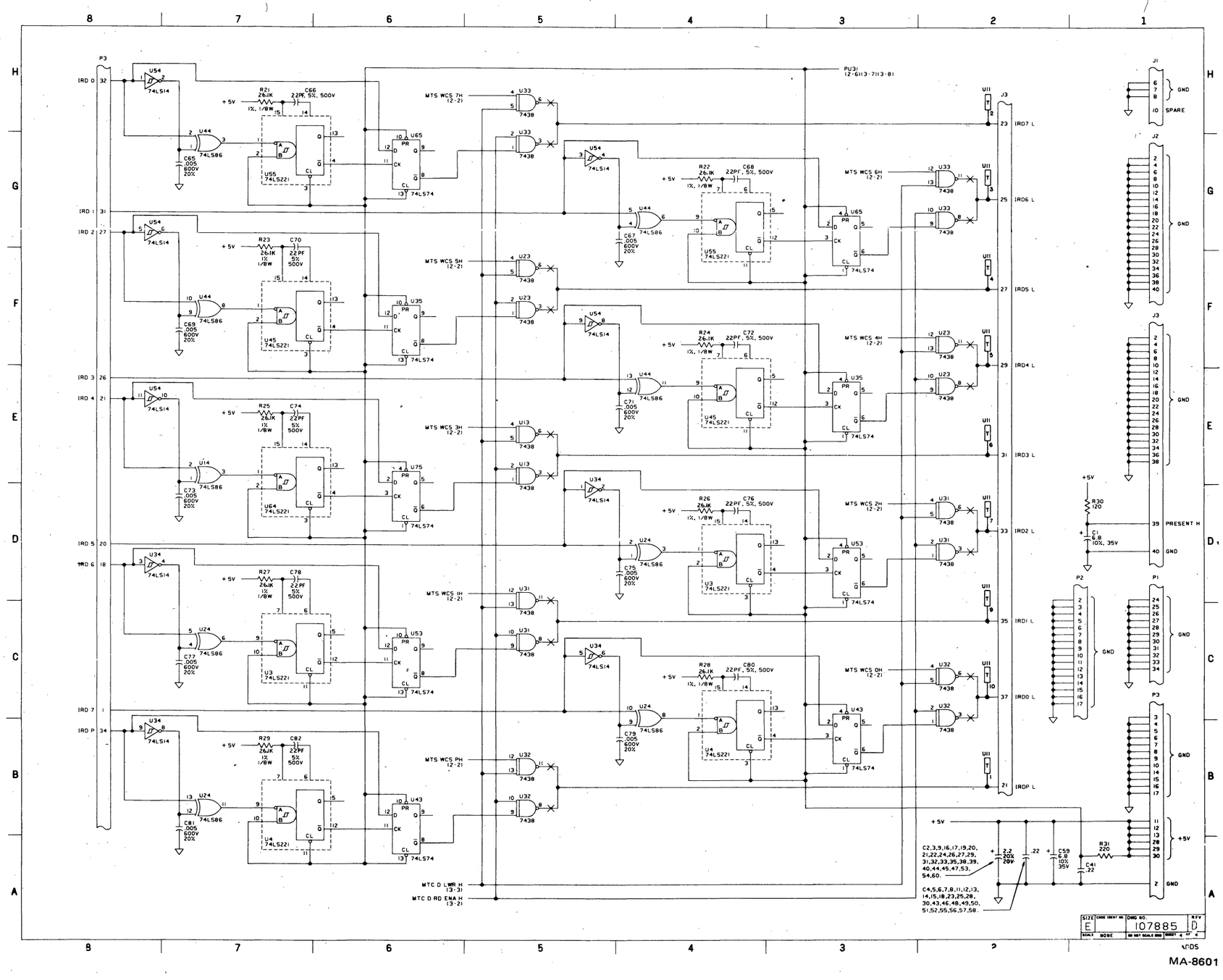


Figure 25 Schematic, MIA (Sheet 4 of 4)

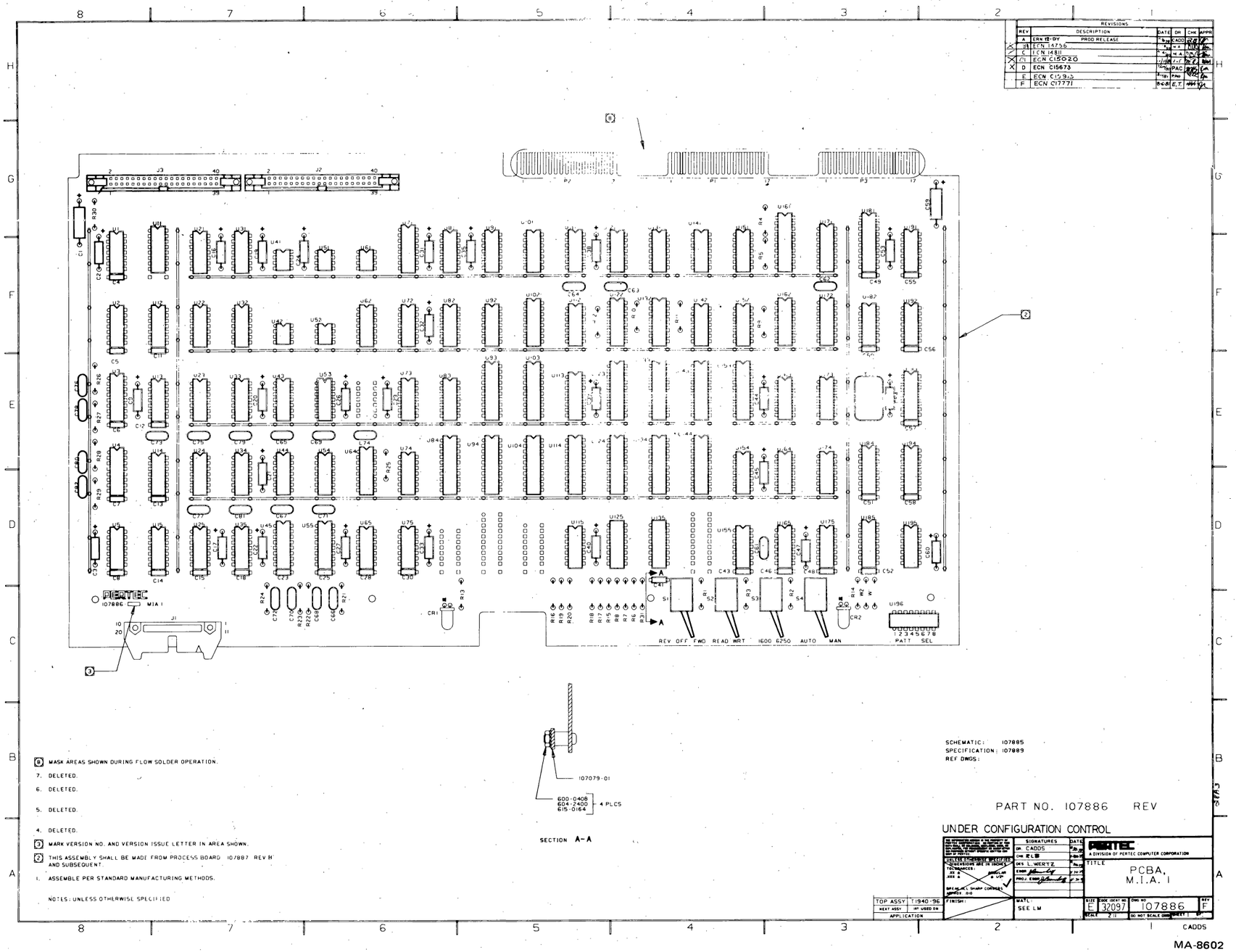


Figure 26 PCBA, MIA