

# ENGINEERING NOTICE

REISSUE OF  
CHANGED REV LTR  
OF 44PO233 9/1/74  
WAS  
9/1/74  
9/1/74  
9/1/74  
9/1/74

E.N. NO. 82268-C  
PAGE 1 OF 3  
ISSUE DATE 9-4-74



MODEL NUMBER <b>620-30</b>	EFFECTIVE SERIAL <b>EARLIEST</b>	PARTS DISPOSITION	
DEVICE <b>9 TRK MAG</b>	<b>OPPORTUNITY</b>	<input checked="" type="checkbox"/> USE AS IS	<input type="checkbox"/> SCRAP
TAPE CONTR. <b>BD 1 &amp; 2</b>		<input type="checkbox"/> REWORK	<input type="checkbox"/> NOT APPLICABLE

### TYPE OF INFORMATION

<input checked="" type="checkbox"/> DRAWING RELEASE	<input checked="" type="checkbox"/> DRAWING CHANGE	<input checked="" type="checkbox"/> RECORD CHANGE	<input type="checkbox"/> SUBSTITUTION OR DEVIATION	<input type="checkbox"/> STOP ORDER
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REASON FOR ACTION 1. TO REVISE CONT. BDS TO FUNCTION WITH 49A0128-DD1 IN PLACE OF 49A0010-DDD 2. WIRING CHANGES NECESSARY TO ACCOMMODATE ABET TEST 3. TO ELIMINATE RACE CONDITION	CHANGE CODE <u>2</u>  OUTSTANDING CODE 2 EN 82538 (OIP0869) 82517 (44PO232, 44PO233)
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ACTION TO BE TAKEN  
RELEASE FOR PRODUCTION

- REV
- 91C0482 A LOGIC DIAGRAM; 9 TRK MAG TAPE CONT. BD #1
  - 91C0483 A LOGIC DIAGRAM; 9 TRK MAG TAPE CONT. BD #2
  - 95W1052 A WIRE LIST; 9 TRK MAG TAPE CONT. BD #1
  - 95W1053 A WIRE LIST; 9 TRK MAG TAPE CONT. BD #2
  - 95W1103 A HAND WIRE LIST - 9 TRK MAG TAPE CONT. BD #1
  - O1A0869 ASSY 9 TRK MAG TAPE OPTION 620-30
  - 1. SHT 3. REMOVE DASH NUMBER FROM 4400232-000 & 4400233-000
  - OIP0869 PARTS LIST 9 TRK MAG TAPE OPTION 620-30
  - 1. LINE OUT F/N 1 & 2

\*REVISED DELLIMS ISSUED WITH THIS EN

### DOCUMENTS AFFECTED

DOCUMENT	REV.	DOCUMENT	IS	WAS	REFERENCE DOCUMENTS
O1A0869*	IS	44PO232*	-	R	RECD #4985, #3021, #4669, #4667, #5152
OIP0869*	-	4400232*	-	G	
OIP0313*	C	44PO233*	G	F	
	B	4400233*	-	E	

DRAFTSMAN	CHECKER	PROJECT ENGR.	RESP. MGR.	REVIEW BOARD
<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>



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## 01P0869 (CONTINUED)

2. ADD FIN 6 & 7 AS FOLLOWS

1	6	4400232-001	ASSY-MAG TAPE CONT BD #1
1	7	4400233-001	ASSY-MAG TAPE CONT BD #2

## 01P0313 PARTS LIST 9 TRK MAG TAPE OPTION 6202-30

1. LINE OUT FIN 1, 2, 8 & 9

2. ADD FIN 7, 15, 16, 17 & 18 AS FOLLOWS

REF	-	7	95W1103	W/L HAND WIRING
1	1	15	4400232-001	ASSY-MAG TAPE CONT BD #1
1	1	16	4400233-001	ASSY-MAG TAPE CONT BD #2
REF	REF	17	95W1052	W/L TAPE CONT. BOARD #1
REF	REF	18	95W1053	W/L TAPE CONT. BOARD #2

## 4400232 PARTS LIST 9 TRK MAG TAPE CONTROLLER BOARD #1

1. REVISE & REDRAW

2. ADD -001 VERSION; SAME AS -000 EXCEPT AS FOLLOWS

001	000	FIND NO.	PART. NUMBER	DESCRIPTION	REMARKS
-	REF	-	91C0032 S	LOGIC DIAGRAM	
REF	-	-	91C0482 A	LOGIC DIAGRAM	
-	REF	-	95W10201 R	WIRE LIST	
REF	-	-	95W1052 A	WIRE LIST	
106	108	3	58A0060-000	SOCKET, 4 PIN	
-	9	27	49A0010-000	INT. CKT.	IC 12, 19, 20, 21, 22, 23, 07 & P3
2	-	36	49A0022-000	INT. CKT.	IC 27 & G7
5	-	37	49A0128-001	INT. CKT.	IC 12, 19, 28, 38 & P3
REF	-	-	95W1103 A	HAND WIRE LIST	

## 4400232 ASSY 9 TRK MAG TAPE CONTROLLER BOARD #2

1. REVISED & REDRAWN ADDING -001 VERSION

2. ADDED 95W1103 TO REFERENCE DRAWING (-001) ONLY

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## 44PO233 PARTS LIST 9TRK MAG TAPE BOARD #2

1. REVISE & REDRAW

2. ADD -001 VERSION; SAME AS -000 EXCEPT AS FOLLOWS

OO1	OOO	FIND NO	PART NUMBER	DESCRIPTION	REMARKS
-	REF	-	91C0033 F	LOGIC DIAGRAM	
REF	-	-	91C0483 A	LOGIC DIAGRAM	
-	REF	-	95W10202 H	WIRE LIST	
REF	-	-	95W1053 A	WIRE LIST	
146	154	2	58A0060-000	SOCKET, 14 PIN	
206	162	4	58A0062-002	POST	
-	17	24	49A0010-000	INT CKT	IC 12, 23, 24, 36, 48, 49, 62, 74, 113, 114, 126, 127, 139, 140, 148, 149 & 150
9	-	33	49A0128-001	INT CKT	IC 12, 24, 49, 62, 113, 114, 139, 140 & 150

3. QUANTITY OF F/N 26 49A0009-000 IS: 18 WAS: 19

4. ADD F/N 34 AS FOLLOWS:

1	1	34	49A0554-001	INT. CKT.	IC 57
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## 44QD233 ASSY 9TRK MAG TAPE CONTROLLER BOARD #2

1. ADDED -001 VERSION; TAB BLOCK & REF. DRAWINGS 91C0483 & 95W1053

2. ADDED G/N  $\triangle$  9 AS FOLLOWS:

$\triangle$  IC'S 23, 36, 48, 74, 126, 127, 148, & 149 FOR -000 ONLY

DWG NO. 01A1737

REVISIONS

REV	EN	CHG CODE	DESCRIPTION	DR	APPD

Top Assembly for modification to standard 9 track mag tape controller

NEXT ASSEMBLY

01A1231X

MODEL NO.

E-2135 B2



varian data machines / a varian subsidiary  
2722 michelson drive / irvine / california / 92664

DR C. Towner 9-74

CHK

DSGN

ENGR *J. H. Hulse* 9-74

APPD

APPD

CODE IDENT NO. **21101**

THIS DOCUMENT MAY CONTAIN PROPRIETARY INFORMATION AND SUCH INFORMATION MAY NOT BE DISCLOSED TO OTHERS FOR ANY PURPOSE OR USED TO PRODUCE THE ARTICLE OR SUBJECT, WITHOUT PERMISSION FROM VDM.

TITLE  
9 TRACK RAW  
25 IPS  
MAG TAPE OPTION

SIZE DWG NO. REV

**A**

01A1737

X

SHEET / OF 15



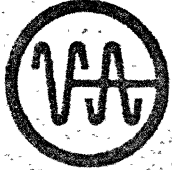
# ENGINEERING DATA FORM

OPTION ----- 9 Trk. RAW 25 IPS Mag Tape Option  
 MODEL ----- E-2135 B2  
 NO. OF LOGIC CARDS REQ'D. ----- -2  
 NO. OF CARD SLOTS REQ'D. ----- 6  
 LOCATION OF SLOTS (NUMBERING) ----- -  
 CONNECTORS REQ'D. (EXCLUDING I/O) ----- -  
 KEYING ----- -  
 ST'D. DEVICE ADDRESS ----- 10  
 WIRELIST NUMBER ----- Board 1 - 95W0201 Board 2 - 95W0202  
 MANUAL PUBLICATIONS NUMBER ----- 98A9902-120 (std. controller)  
 PERIPHERAL EQUIPT. REQ'D ----- 25 IPS, RAW M.T.U. NRZI Recording  
 MFG'R. ----- Pertec  
 MODEL ----- 7840-9  
 GEN'L. SPECS -----

**NOTES:**

Reference Drawings:

Logic Diagram Board #1	91C0337
Logic Diagram Board #2	91C0338
Timing functions on logic will be for 25 IPS instead of 12.5 IPS.	
Assembly Drawings Board #1	44D0232
Assembly Drawings Board #2	44D0233
Test Specs	98A0241
PPS	98A0165

 <p><b>varian data machines</b> a varian subsidiary 2722 michelson drive irvine/california/92664</p>	<b>CODE IDENT. NO</b>	01A1737	<b>REV</b>
	PREPARED BY	APPR.	SHT 1 OF 15

## 1.0 PURPOSE

The purpose of this modification procedure is to convert the PEC 9 Track 800 BPI 25 IPS Standard Mag Tape Control Unit (620/i-30) to operate with the PEC Model 7840-9 Tape Transport, which is a read after write (dual head) 25 IPS 800 BPI unit,

Note: When ordering PEC Model 7840-9 unit, order unit with 25 IPS transport and standard start/stop time.

## 2.0 REFERENCE DRAWINGS

See Option Drawing 01A0313 to lead to all other drawings for the Standard 620/i-30 9 Track Controller.

See this drawing and logic diagrams 91C0337 and 91C0338 for complete modification and updated logic.

See PPS 98A0165, Test Spec. 98A0241 and manual number 98A9902-120 for Standard Controller. The theory of operation of this modification is included in this document.

Testing of unit after mod installation will follow standard test procedures (98A0241).

## 2.1 CABLE

Use cable 01A1231-002 described in this document page 15.

## 3.0 MODIFICATION INSTRUCTIONS

3.1 Secure parts described on parts list.

## 3.2 MOUNTING INSTRUCTIONS

### 3.2.1

Install IC sockets in the following positions on board #2 (44D0233).

A8, B8, G10, L5, L6, M2, M4, D13, L2  
Solder pins 7 and 14 of socket.

### 3.2.2

Build the following assy. and mount in position M4 of board #2. Label assy.  
01A1231-002.



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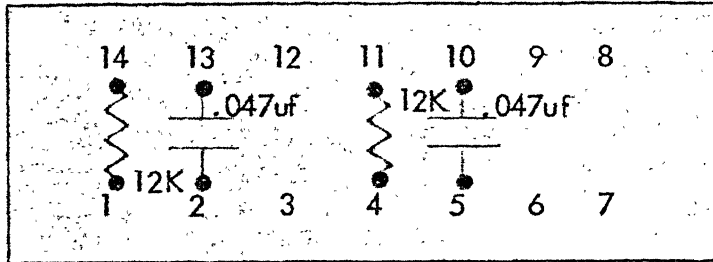
CODE  
IDENT. NO.  
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Augat board 57A0054-002



### 3.2.3

Add IC's to the following positions of Board #2.

<u>Location</u>	<u>Type IC</u>
A8, B8	846
G10	7473
L5, L6	9601
M2	830
D13	846
L2	9016

### 3.2.4 Add/Delete Wiring Board #2

See pages 8 thru 14 for changes.

### 3.2.5 Add/Delete Wiring Board #1

See page 14.

## 3.3 NEW LABELS

Mark both boards with new labels.

### Board #1

P/N            01A1737X  
W/L            95W0201 - modified  
Logic          91C0337X



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Board #2

P/N 01A1737  
W/L 95W0202 - modified  
Logic 91C0338X

4.0 TESTING

4.1 TIME DELAYS (Board #1)

Using Standard Testing Procedures (98A0241) for the PEC 9 Trk. 25 IPS unit, use the following new time delay settings for the Read-After-Write Modified Controller.

All adjustments are made on board #1.

<u>Time Delay Name</u>	<u>Time Delay</u>	<u>Pot Adjust</u>
Start Lg. Wr. Delay (STLWD)	150 ms	R1
Start Write Motion (STWM)	17.4 ms	R9
Start Lg. Rd. Motion (STRIM)	60 ms	R8
Start Rd. Motion (STRDM)	12 ms	R3
Stop Delay (STPDY)	.5 ms	R2
Stop Motion (STPM)	18 ms	R5
Turn Around Delay (TAD)	250 ms	R4
Fwd. Gap Detect (RDD2)	175 us	R7
Rev. Gap Detect (RDD1)	425 us	R6

4.2 TIME DELAY BOARD #2

While executing a write instruction, scope F/F WFF1+ (L5-8, see page 21 Logic 91C0313).

Term WFF1+ follows one-shot WOS1+. WOS1's time period should be 3.5 times the character rate (50 us) = 175 us

Scope term WOS2+ while writing (L6-008) and verify time period is also 175 us.

Both time delays are fixed and cannot be adjusted. Timing components are located on assy. in location M4.

See following Theory of Operations for explanation of new time delays and modification.



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### 4.3 INNER RECORD GAP

Verify, after writing a succession of small blocks of data on tape, that the IRG is .6" or greater. Nominal spacing is .6". Verify GAP with Visamag or other iron filing solutions.

### 5.0 THEORY OF OPERATION OF MODIFICATION

With the ability of reading data while writing, a new vertical parity check circuit and control logic is necessary to check for correctly written data during the write operation. See new logic diagram 91C0338 page 21.

As data is written on tape, .15" later the data is picked up by the Read Head. The Read Strobes will keep WOS1 one shot set (see page 21, 91C0338). When no more data is encountered by the Read Head, WOS1 will time out in approximately 3.5 character times (175) causing F/F WFF1 to set. The false output of WFF1 returns back to WOS1 to trigger WOS1 one more time. As long as WOS1 is set, the read data is parity checked at WVRC gate, and if the data is parity incorrect, the strobe pulse SRS will allow setting the "Tape Data Error" F/F IDER.

The second firing of WOS1 allows the CRC character to be parity checked. WOS1 again times out resetting F/F WFF1. WFF1 resetting fires WOS2 one shot which inhibits WOS1 from setting when and if the LRC strobe pulse occurs (SRS). WOS2 will time out in 3.5 character times, allowing the LRC character to pass the read head. (LRC will be checked in the LRC checker circuits).

WOS2 resetting will set F/F WFF2, which when synchronized with a clock pulse, will set WFF3 F/F for one clock time. With WFF3 set for one clock time, the LRC register is checked for an LRC error (and sets TDER if an error existed) and WFF3- is routed to board #1 to fire the stop delay one shot STPDY. WFF3- replaces term KDL1B which is the normal write term to stop the write instruction. Since write data is delayed before reading, all data written has to be past the read head prior to stopping tape motion. Note: The CRC character is parity checked only. No logical attempt is made to check the validity of the CRC character.

### 6.0 PROGRAMMING

No special programming is required as a result of this mod. Written data is checked for vertical as well as longitudinal parity correctness during the write operation and as soon as the tape controller is sensed ready, a sense for error can be executed.



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QUANTITY REQ'D PER DASH NO.							PARTS LIST				CODE IDENT: 21101			
						000	FIND NO.	PART NUMBER	DESCRIPTION	REMARKS				
						1		44P0232-000D	620-30 Contr. Bd. #1					
						1		44P0233-000B	620-30 Contr. Bd. #2					
						9		58A0060-000	IC Socket 14 Pin					
						2		49A0002-000	7473 IC					
						2		49A0024-000	9601 IC					
						1		49A0011-000	830 IC					
						1		57A0115-000	Adapter Plug					
						3		49A0508-000	846 IC					
						1		49A0023-000	9016 IC					
						1		57A0054-002	Augat Board					
						2		65N2500-123	12K resistor					
						3		71N0352-473	.047uf Cap.					
NEXT ASSY							MODEL NO.			APPD			TITLE: PARTS LIST	
REV														
EN NO.													01A1737	
DATE												DWG NO.	REV	
DR														
CHK												SHEET <u>7</u> OF <u>15</u>		


96A0017-000C



SIGNAL NAME	FROM	TO	REMARKS E2135B2
			BOARD # 2 DELETES
KDLIB	N01-13	P01-115	
	N2-10	N1-9	
TCEKE+	L4-5	R6-5	
	R6-5	T5-3	
CAI+	M7-3	M8-1	
	M7-14	E6-12	
CB2+	M7-7	M8-4	
	M7-10	E6-2	
CB3+	L8-10	L7-3	
	L7-14	E5-12	
CB4+	L7-7	L9-4	
	L7-10	E5-2	
CB5+	D6-12	K7-14	
	K8-1	K7-3	
CB6+	K7-7	R8-10	
	D6-2	K7-10	
CB7+	H7-3	N7-1	
	D5-12	H7-14	
CB8+	H7-7	N7-4	
	H7-10	D5-2	
CB9+	L10-7	R9-10	
	D11-5	L10-10	
LRD+	S5-3	N11-1	
	N11-1	N11-12	
RDSTB-	G1-8	F4-13	
	F7-3	F4-13	
SRS-	R1-12	S5-1	
	S5-1	H8-8	
	R1-12	P1-84	

WIRE LIST No. 001	By	CODE IDENT	WL	REV
 <b>varian data machines</b> a varian subsidiary newport beach/california		21101	01A1737	
		SHEET 8 OF 15	DATE	

SIGNAL NAME	FROM	TO	REMARKS
			E2135B2
			ADDS
KDLIB	N2-10	N1-13	
CB1+	E6-12	M8-1	
CB2+	E6-2	M8-4	
CB3+	E5-12	L8-10	
CB4+	E5-2	L9-4	
CB5+	D6-12	K8-1	
CB6+	D6-2	R8-10	
CB7+	D5-12	N7-1	
CB8+	D5-2	N7-4	
CB9+	D11-5	R9-10	
RD1+	H13-3	M7-3	
RD2+	M7-7	H13-6	
RD3+	H13-8	L7-3	
RD4+	H13-10	L7-7	
RD5+	M11-13	K7-3	
RD6+	M11-2	K7-7	
RD7+	H12-6	H7-3	
	H12-6	B8-9	


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		21101		
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BOARD #7 ADD

PA

SIGNAL NAME	FROM	TO	REMARKS
RD8+	H7-7	N11-2	
	H7-10	H11-5	
RD9+	K12-11	L10-7	
	L10-7	K12-4	
SRS+	R6-4	S5-1	
	M2-4	N3-11	
	N3-11	F10-10	
ERDL+	S1-1	S5-2	
	F3-2	M2-10	
LRD-	S5-3	E8-9	
LRD+	N11-1	N11-12	
	E8-8	E11-1	
WRS-	M2-6	L5-1	
WRS10	L5-11	M4-13	
WRS1RC	L5-13	M4-1	
	M4-1	M4-2	
PSVM03	M3-14	M4-14	
	M4-14	M4-11	
W051+	G10-5	L5-8	N3-10
PSV009	G9-14	G10-4	
WFF1+	G10-9	G10-10	
WFF1-	M2-1	L6-3	
	L6-3	G10-7	
	G10-7	G10-8	
	G10-8	L5-2	
G05106	L6-1	L6-2	
	L6-2	L6-7	
W052+	L6-8	G10-1	
	L6-6	M2-2	
W052C+	L6-11	M4-10	
RC	L6-13	M4-4	
	M4-4	M4-5	
SRS-	R1-12	P1-84	
	R1-12	H8-8	

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 <b>varian data machines</b> a varian subsidiary newport beach/california		21101		
		SHEET 10 OF 15	DATE	



BOARD #2 ADD

SIGNAL NAME	FROM	TO	REMARKS
WFF24	G10-12	N1-3	
	G10-13	G10-14	
GUG09	G9-7	G10-11	
TELIF+	N1-4	B10-5	
WFF21-	N1-6	E8-1	
	E8-2	E10-5	
WFF3+	M6-11	E10-9	
	E10-9	D13-2	
	E10-7	E10-8	G10-2
	G10-2	P1-15	
TELKEP	L4-5	T5-3	
TSS+	P1-109	D13-9	
WFFR-	E10-6	G10-6	
	G10-6	D13-3	
	D13-8	D12-3	
LRCER-	E12-12	D13-12	
	D13-11	M6-10	
DSTDER	F12-8	M6-8	
	M6-8	N3-8	
RD1+	G11-13	A8-1	
	H11-9	A8-4	
RD2+	E8-13	A8-2	
	E8-12	A8-5	
RD3+	E11-2	A8-9	
	H11-12	A8-12	
RD44	G11-2	A8-10	
RD4-T	H13-11	A8-13	
S+	H12-13	B8-1	
	H11-1	B8-4	
RD6+	H12-2	B8-2	
	H11-2	B8-5	
TCLKE+	G7-2	D13-1	

WIRE LIST No. 001

By

CODE IDENT

WL

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BOARD # Z ADD

SIGNAL NAME	FROM	TO	REMARKS
RD7-1	H7-3	B8-9	
RD7-2	H12-5	B8-12	
RD8-1	H7-7	B9-10	
RD8-2	H12-11	B8-13	
RD9-1	E11-13	D13-4	
RD9-2	L13-7	S1-5	
WVRC1	N3-7	D13-6	
	N3-7	S1-6	
WVRC1	B2-7	A8-3	
	A8-3	A8-6	
	A8-6	L2-1	
	L2-2	B2-1	
WVRC2	A8-8	A8-11	
	A8-11	B2-5	
	B2-5	L2-3	
	L2-4	B2-2	
WVRC3	B8-3	B8-6	
	B8-6	L2-5	
	L2-5	R7-4	
	L2-6	B2-12	
WVRC4	B8-8	B8-11	
	B8-11	L2-9	
	L2-9	R7-5	
WVRC4	L2-8	B2-13	
WVRC5	B2-3	B2-6	
	B2-6	E9-1	
	E9-1	L2-11	
WVRC5	L2-10	R1-1	
WVRC6	B2-11	R7-6	
	R7-6	L2-13	
	L2-13	E9-2	
WVRC6	L2-12	R1-2	

WIRE LIST No. 001	By	CODE IDENT	WL	REV
 <b>varian data machines</b> a varian subsidiary 10001 beach, california		21101		
		SHEET 12 OF 15	DATE	

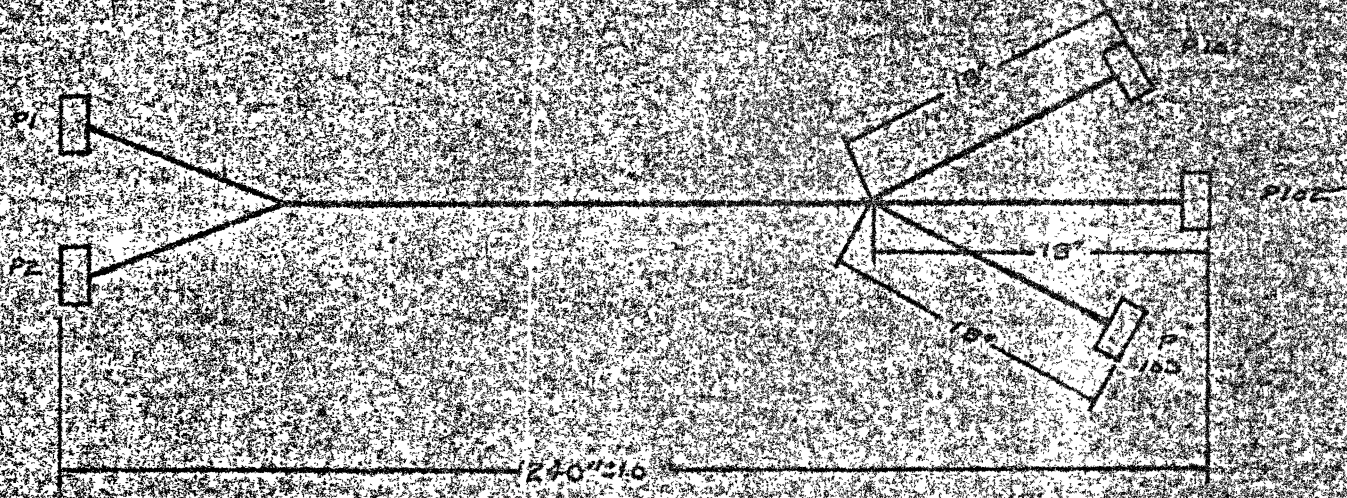













WIRE TO MTU CABLE W/L #75 WD662  
 LABEL DIA 1231-002

REV	DIA 1231-002
CODE IDENT NO	APR 1975
PREPARED BY	SMT 7506 75
 MTI Machine Control Machines	