CRT-14
CONTROL RELAY TRANSLATOR

INDUSTRIAL CONTROL PRODUCTS

digital

```
!  412   402             B001 002                                  B002 001   777    422 !
+--[ ]--[/]------------+---[/]-----------------------------+---[ ]--[/]---( )-+
!  006   004   001    !                                    !                       !
+--[/]--[ ]--[/]---+                                       +                       +
!  435                !                                    !                       !
+--[ ]--------------+                                      +                       +
!  003   374   373   372   371   370   367   366   !                              !
+--[ ]--[ ]--[ ]--[ ]--[ ]--[ ]--[ ]--[ ]---+                                     +
!  004   377                   B003 401   777     !                               !
+--[/]--[ ]----------------+---[ ]--[ ]---------+                                 +
!  407          B004 374    !                                                     !
+--[ ]---------+---[ ]---+                                                         +
!  376   375    !                                                                 !
+--[ ]--[ ]---+                                                                    +


!  001                                                      B001        415 !
+--[ ]---------------------------------------------------+---------( )-+
!  002   020   021                          B002 012    !                   !
+--[ ]--[ ]--[ ]------------------------+---[ ]---+                         +
!  003                        B003 011    !                                 !
+--[ ]-----------------------+---[ ]---+                                     +
!  004               B004 010    !                                          !
+--[ ]--------------+---[ ]---+                                              +
!  005   B005 007    !                                                      !
+--[ ]---+---[ ]---+                                                         +
!  006    !                                                                 !
+--[ ]---+


!  012                                                      B001        404 !
+--[ ]---------------------------------------------------+---------( )-+
!  013                                                   !                   !
+--[ ]-----------------------------------------------+                       +
!  014                          B002 016   B005 020    !                     !
+--[ ]------------------------+---[ ]---+---[ ]---+                          +
!  015   B003 023   B004 021    !          !                                 !
+--[ ]---+---[ ]---+---[ ]---+              !                                 !
!  022    !          !                      !                                 !
+--[ ]---+          +                      +                                 +
!  020              !                      !                                 !
+--[ ]-------------+                      +                                 +
!  017                                     !                                 !
+--[ ]------------------------------------+                                 +
```

Programmable controllers have become widely used and accepted in industry. As a result two basic methods have developed for expressing the control sequence—boolean equations and ladder diagrams. Digital Equipment Corporation's aim is to give the user the ability to choose either method for implementing the PDP-14 Programmable Controller. The computer aided software provided by Digital Equipment Corporation for use in developing PDP-14 programs in boolean equations is well known. Digital now provides a new technique for PDP-14 program preparation. This development is known as CRT-14.

CRT-14 allows the user to program a PDP-14 from ladder diagrams. The control engineer merely enters information into a CRT terminal or Teletype keyboard using familiar relay symbology. CRT-14 provides the user with the ability to completely edit his program, display the results, and generate hard copy of the program in ladder diagram form. Once the user has debugged his program, CRT-14 provides a tape from which the PDP-14 Programmable Controller memory is made. It's that easy.

CRT-14 Features

1. Uses ladder diagrams to develop PDP-14 program.
2. Provides visual display of control circuits.
3. Provides hard-copy documentation of complete program in ladder diagram form.
4. Complete editing capability included.
5. Visual verification of changes as they are made.
6. Run equipment on-line before final memory is prepared.
7. Provides the tape from which memory is made.
8. No machine language required to program.
9. Operates on Teletype and/or CRT terminal with any PDP-8 family computer.
10. Handles up to 255 outputs.
11. Maximum of 110 input contacts, output contacts, and branch point combinations per output.
12. Provided free of charge with PDP-14 system.

Design Rules

1. One output circuit may contain up to 10 lines, each line containing a combination of 11 input contacts, output contacts and branch points.
2. The same contact may be used in as many circuits as necessary.
3. All branch paths must return to L1 (AC line or DC Supply).
4. All branch points (origin of a branch) must be numbered.
5. All inputs wired to PDP-14 terminals are numbered 0–377 octal (no eight's or nine's). All outputs wired to PDP-14 terminals are numbered 400–777 octal (no eight's or nine's).

PROGRAMMING WITH CRT-14

INPUTS	TERMINAL #
LS₁	1
LS₂	2
LS₃	3

OUTPUTS	TERMINAL #
1CR	401
2CR	402
3CR	403

YOU TYPE : DESCRIPTION OF ITEM
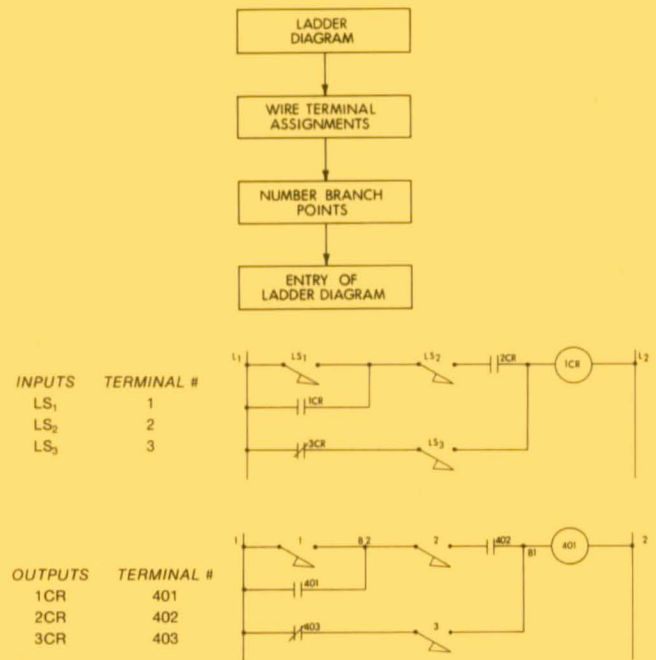
YOU TYPE	DESCRIPTION OF ITEM
L1	(Reference AC line or DC supply)
—| |— 1	(N/O input #1)
B2	(Branch point 2)
L1	(Reference AC line or DC supply)
—| |— 401	(N/O contact #401)
B2	(Branch point 2)
—| |— 2	(N/O input #2)
—| |— 402	(N/O output #402)
B1	(Branch point 1)
L1	(Reference AC line or DC supply)
—|/|— 403	(N/C output #403)
—| |— 3	(N/O input #3)
B1	(Branch point 1)
—( )— 401	(Output driver 401—end of circuit)
⟩	(Carriage return)
E ⎫	(Display complete
L ⎭	ladder diagram)

KEYBOARD SYMBOLS

SYMBOL	REPRESENTS
L1	Line 1 (AC line or DC supply)
B	Branch Point
—| |—	Normally open contact
—|/|—	Normally closed contact
—( )—	Output driver (end of circuit)