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DECUS NO.	12-33
TITLE	KWANDA
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DATE	June 28, 1971
SOURCE LANGUAGE	LAP6-DIAL

KWANDA: An Interactive Display Subroutine

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KWANDA is an expanded version of QANDA (Dec - 12 - FISA). Many modifications are made to QANDA but the core requirements (1000 octal locations) are unchanged and the calling sequence is basically the same. Basically 5 changes have been incorporated:

1. The size of the answer field has been increased to a maximum of 99 by using a 2 digit format. Although this many digits will result in wrap around of the characters on 1 line, nearly half this many characters may be displayed without overlap. In order for this change to be possible all answer field specifications must use 2 digits. For example, the following text and answer field specifications result in the corresponding displays:

- a. Z THE NUMBER IS <03\Z
"THE NUMBER IS ___"
- b. Z THE NUMBER IS <10\Z
"THE NUMBER IS _____"

Note that the field size is specified in octal. The digits 8 and 9 may be used and their octal value will be utilized for example, <09 will leave 9 decimal spaces, <19 will leave 19 decimal spaces but <21 will also leave 19 decimal spaces.

2. KWANDA need no longer reside in the current instruction field. KWANDA is always called in the following way.

```
Start, LIF n
      JMP QENTR           /QENTR = 1703
      TXT
      ANS
      JMP QARFSH         /QARFSH = 1061
```

where n = field in which KWANDA resides, TXT and ANS are respectively the addresses of the text and answer buffers in the segment from which the call is made. The addresses of QENTR & QARFSH are based on a starting address of 1000 for KWANDA. Return to the main program is at Start +4 to refresh the display (see QANDA description), to Start +5 if a line feed is struck or if no answer field is used and a carriage return is typed. In both of these cases the accumulator is zero upon return.

IF a JMP QARFSH is not used at START +4, and the user wishes to perform some operations before refreshing the display, the data field must be reset to the segment containing the text and answer buffers before the jump to QARFSH. This procedure is illustrated in the sample program. This program displays a text string with an answer field in full size characters while sampling channel 0 and displaying the result.

3. In addition to text display from any core segment, KWANDA provides access to the teletype for input and output from any segment. The keyboard input routine within KWANDA may be called from any segment by the following:

```
Calltty, LIF n
        JMP GTKBD         /GTKBD = 1757
```

return is to the main program at Calltty +2 with the ASCII code of the key typed in the accumulator.

The keyboard output routine is called by

```
OTPT, LIF n
      LDA
      "CHAR"
      JMP IQATYP          /IQATYP = 1764
```

"CHAR" is the address of the ASCII code to be typed. Return to the program after typing is at OTPT +4. In both cases n = segment # in which KWANDA resides (starting at 1000 in this case).

4. Because of the increase in the possible input to any particular KWANDA display, the recommended faster teletype I/O (see QANDA description) is used. For large displays, less flicker is observed. As a result, the teletype device flags must be cleared once before the first entrance to KWANDA. This is accomplished by including an

```
IOB
6032
IOB
6046
```

in the program before the first call to either the teletype subroutines or to KWANDA.

5. Under certain circumstances it is useful to terminate a KWANDA display before completing the answer field, and exercise one of many options. For example, during a KWANDA display of some results of an analysis, the user may wish to choose another analysis program or restart the current program, go to a different display, or plot some results, etc. These options could be selected by typing a single key on the teletypewriter

without providing room for such options via the KWANDA display. This capability is available in KWANDA by typing a control character (i. e. , control and a character typed simultaneously) during the KWANDA display. Return is made to the user's main program as though a line feed had been typed, except the ASCII value of the code typed is in the accumulator. The user may then examine this code to determine his future action. The following example demonstrates this:

```
Start, LIF 6
      JMP QENTR
      TXT 1
      ANS
      JMP QARFSH
      SAE I
      223
      JMP START
      .
      .
      .
```

In this simple case the display continues until a control-s is typed. If any other character is typed the display is reinitialized.

Important addresses:

QENTR = 1703	KWANDA entrance from any field
QARFSH = 1061	Entrance for refresh
IQATYP = 1764	TTY output from any field
GTKBD = 1757	Keyboard input from any field

Requirements: PDP-12A

1000 octal core locations