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DECUS NO.	12-4
TITLE	IRDA
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SOURCE LANGUAGE	LAP6-DIAL

1. INTRODUCTION

The IRDA (infra-red data acquisition) program acquires
asynchronous data from an interfaced instrument, displays
the data on the scope, and stores it on LINCtape. IRDA
is compatible with any device that transmits X-Y data at
a rate as fast as 103 milliseconds/point and accepts up
to a maximum of 1000_{10} data points. The external asyn-
chronous device is interfaced[1] to the PDP-12 computer by
two potentiometers; one transmits X axis input (indepen-
dent variable), the other transmits Y axis input (depen-
dent variable). For every one bit increment in the X axis,
IRDA retrieves one value from the Y pot and stores it in
the data area. For example, IRDA can generate an absorp-
tion spectrum from an infra-red spectrophotometer.

2. MINIMUM REQUIREMENTS

PDP 12A with 4K of core and KW12A
LAP6-DIAL[2] version 2 tape with the IRDA program

3. OPERATING PROCEDURES

3.1 Analog Input

When interfacing the analytical instrument to the PDP-12,
the X axis input is connected to analog channel 11 and
the Y axis input is connected to analog channel 10.

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[1] A typical interface diagram is available from the PDP-12
Product Line.

[2] LAP6-DIAL is hereafter referred to as DIAL.

3.2   Loading IRDA

a.   Load DIAL (refer to the LAP6-DIAL Manual,
     DEC-12-SE2B-D)

b.   Load IRDA by the command

     →LO IRDA,UNIT↲

     If loaded properly, IRDA responds with a
     carriage RETURN, LINE FEED on the Teletype.[(R)]

3.3   Sense Switch Options

Sense Switches Ø and 1 can be set as follows to generate
four displays.

Sense Switch	Value	Display
Ø	1	Help Frame
Ø	Ø	Data Buffer
1	1	Data Buffer full scale
1	Ø	Data Buffer split scope

If SSW1=Ø and the scope channel knob is set to 1 & 2, the
first 5ØØ points are displayed on the upper half of the
scope and the last 5ØØ points are displayed on the lower
half of the scope so that the entire data buffer can be
viewed at once. This effect, called split scope, scales
the data to 8 bits prior to display to inhibit scope wrap-
around. If SSW1=1 and the scope channel knob is set to

(R)
    Teletype is a registered trademark of Teletype Corporation.

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1 & 2, the data is displayed in full scope with the second half of the data buffer imposed on the first half. For full scope display, the data is scaled to 9 bits to prevent scope wrap-around. In either full or split scope, the data is complemented (inverted) before it is displayed. By selecting the proper scope channel when SSW∅=∅, one half of the data buffer can be viewed independently of the other at maximum resolution. The data in the buffer itself is never altered and can be viewed in 1∅ bit uncomplemented form by using MAGSPY.

IRDA's output is also compatible with the CATACAL program which can be used to manipulate the collected data.

4. MODES OF OPERATION

IRDA operates in two modes:

   a. A/D - when it is acquiring data from an external device.

   b. PAUSE - at all other times.

5. HELP FRAME DISPLAY

G	GO
S	STOP
D	DIAL
W	WRITE
M	.DMAGSPY

The action on the right of the display is activated by typing the corresponding letter on the left of the display. In general, if a keyboard command is accepted, the character is echoed on the Teletype; if a command is ignored, it is not echoed on the Teletype.

Note that if the Help Frame is displayed in A/D mode, it
will have no effect on data acquisition.

6. COMMANDS

6.1 G

G is typed to initiate A/D mode when the program is in
PAUSE mode.

6.2 S

The S command terminates A/D mode and enters PAUSE mode.
Note that IRDA will also enter PAUSE mode after it has
gathered 1000_{10} points or if it detects a 20 bit decrease
in the X axis potentiometer. Whenever IRDA terminates data
acquisition, it types the character S on the Teletype.

6.3 D

Restart DIAL by typing D; it is active in either mode.

6.4 W

W writes the data buffers on LINCtape and can only be issued
in PAUSE mode. The W command produces the display:

TBLK _ _ _

The user enters a tape block number from 0 to 777; non-octal
input is ignored. As digits are input to the keyboard, they
are displayed on the scope. The tape block number must be
right justified on input, thus requiring leading and termina-
ting zeroes. Terminate tape block number input with a car-
riage RETURN. IRDA acknowledges the carriage RETURN by typ-
ing the first TBLK onto which it will write. Note that once

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three digits have been entered, the only characters that
are acknowledged are carriage RETURN and W. The data is
always written onto unit one and continues sequentially
for four tape blocks. The display remains active while
IRDA is writing out the data buffers. If an error is made
while typing the reply, W must be retyped to reinitialize
the command. All keyboard commands are ignored until the
write command is completed.

6.5 M

The M command loads the program .DMAGSPY and can only be
issued in PAUSE mode. A DIAL tape containing the DIAL
binary file .DMAGSPY must be on unit zero.

7. DATA BUFFER DISPLAY

IRDA's data buffer is 1000_{10} words long; each word
holds a 10 bit A/D value from the Y axis potentiometer.
IRDA displays only the portion of its buffer that con-
tains data and always displays the first 500 points on
scope channel 1 and the second 500 points on scope chan-
nel 2.

8. CORE REQUIREMENTS

IRDA uses absolute PDP-8 core locations 0-1163 for the
program and locations 6000-7750 for data storage. The
starting address is 0020 in LINC mode with LIF=0.