

Application Note

RECEIPT PRINTER

Receipt Printer

This document explains how to use PASS 6.0 software to program the Analyzer to output information to be printed on the Receipt Printer.

This document includes the following main sections:

- 1 A list of assumptions – knowledge required to perform the tasks outlined in this document
- 2 A statement of the problem to be solved and the proposed solution
- 3 An overview of the Dynalab solution to the problem, including example Sequences for programming the Analyzer to print error information to the Receipt Printer.

Assumptions

To successfully use this document, the following knowledge is required:

- knowledge of how to build Netlists using PASS 6.0
- knowledge of how to use the Sequence table to create a Sequence

For assistance on how to use features of PASS 6.0, see the PASS 6.0 Help file.

Problem

After a harness has been assembled and testing is not successful, error information should be output to a printer for historical reference or for later review to repair the errors found.

Solution



The Dynalab Receipt Printer is used to print custom error reports for quality control assurance. This printer connects to one of the Analyzer's RS-232 serial ports allowing for easy integration into the system. The reports created can include the following detailed information: product part number, revision level, sequential production number, date stamp, Analyzer ID, and a complete list of all failures found by the Dynalab Analyzer. Reports are printed on 3.12" wide thermal paper.

Solution Overview

Interfacing the Receipt Printer to the Analyzer

The Receipt Printer is equipped with a single serial port. The port connector is located on the back of the printer. A serial cable is supplied with the printer. This cable connects the printer's serial port to the port on the back of the Analyzer labeled "SERIAL 2".

Printing Options

There are two basic approaches to printing errors to a Receipt Printer:

- Print a report for every harness
- Print a report only when selected as a menu option

Print a report for every harness

The following example Sequence illustrates how to program the Analyzer to print a report for every harness. For defective harnesses, it will output error messages to the printer as they occur. For harnesses with no defects, it will print a report indicating "ASSEMBLY OK". This approach is only appropriate if the testing philosophy is *build first, then test*. In other words, assembly of the harness should be completed before the Analyzer test is initiated.

Another factor worth noting is error handling. When an error is encountered, the Analyzer will stop, display the error message and immediately cause the error message to be printed. The operator has two choices: correct the error condition, or log the error by pressing the START button. If the operator corrects the error, the Analyzer will continue with the remainder of the test, but the error condition will have already been printed. The corrected error will not be counted as an error when the Analyzer displays and prints the summary report. Therefore, it will be possible to have error conditions printed on the report that were actually corrected and are not counted in the harness's summary report.

Example Sequence to print a report for every harness

Line	Command	Parameter	Application Effect
1	KMESSAGE	1	Displays message 1: "Install Harness, then press START"
2	PRINT		Enable automatic printing of errors
3	PAGESIZE	29	Sets number of printable lines in the form
4	FORMSIZE	33	Sets the number of lines in the form
5	SCOUNT++		Increments the Sequence counter, SCOUNT
6	PROGRAM		Prints the Program Name, Unit ID, and Sequence Counter value
7	PMESSAGE	2	Prints message 2 (Date stamp)
8	SKIP	1	Sends line feed character(s) out serial port
9	TEST	MAIN	Performs a complete scan of the MAIN Netlist
10	SKIP	1	Sends line feed character(s) out serial port
11	REPORT		Displays and prints "Assembly OK" if harness passes all tests, or error summary
12	PAGE		Advances serial printer output to top of next form
13	AUTO		Waits until harness is completely removed
14	REPEAT		Repeats sequence from first line

Line 1 KMESSAGE 1: Displays the message defined as message number 1 in the Messages table. This message should be defined as "Install Harness, then press START". This message will be displayed until the START button is pressed. This message makes it clear that the harness must be assembled before testing.

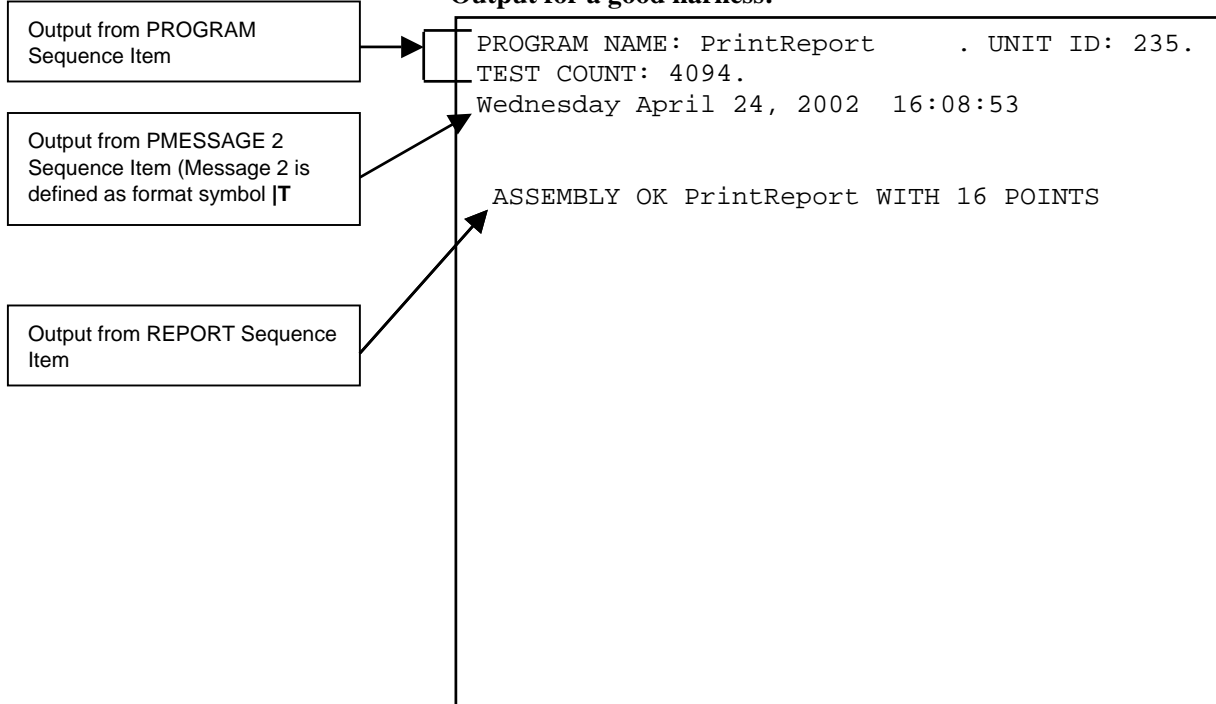
Line 2 PRINT: Causes any error messages and the REPORT summary to be sent to the serial port. Serial port number 2 is the default port. It is assumed that the Receipt Printer is connected to serial port number 2. (This can be changed by using the SERIAL1 Sequence item).

Line 3 PAGESIZE 29: Sets the number of printable lines within the form to 29.

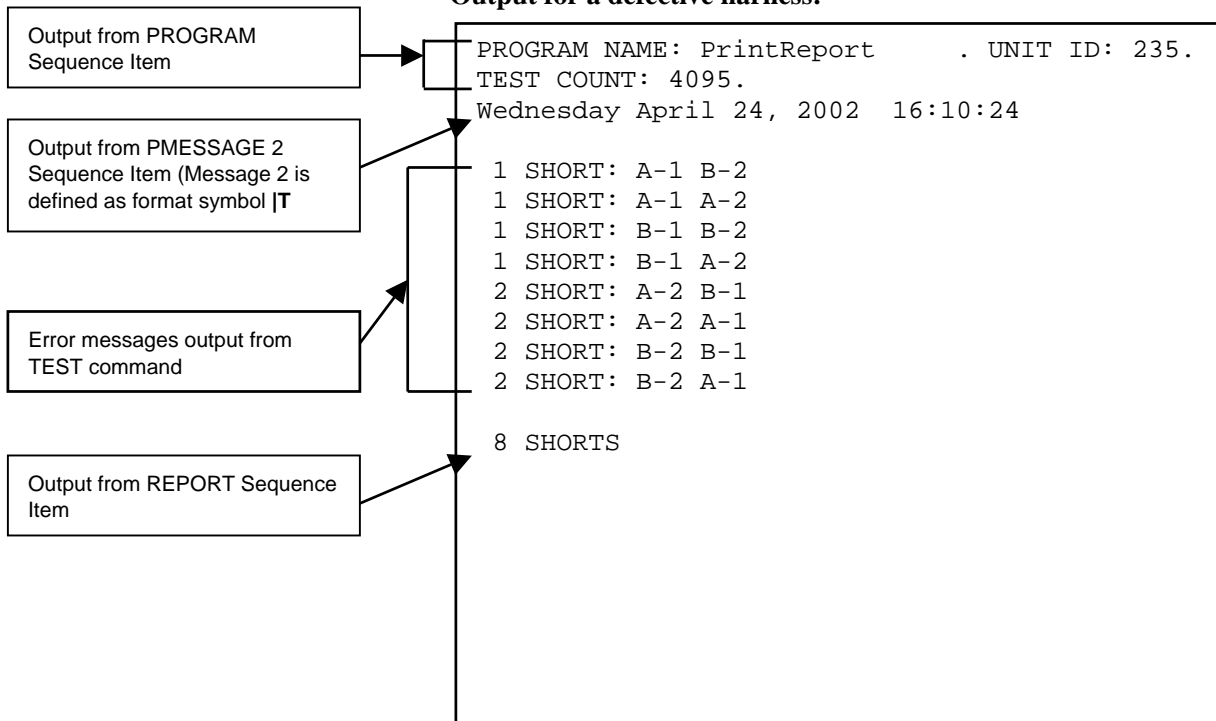
- Line 4** FORMSIZE 33: Sets the number of total lines on a printer form. FORMSIZE must be set to a greater value than PAGESIZE. The effect of the PAGESIZE and FORMSIZE parameters is to allow for a white space margin between each harness's output report.
- Line 5** SCOUNT++: Increments the value of the Sequence counter. Note that in Line 6, the PROGRAM Sequence item prints the value of the Sequence counter. In this context, the Sequence counter is used to count the number of harnesses being tested
- Line 6** PROGRAM: Prints a report header line. The line contains the Program Name, Unit ID, and Sequence Counter value.
- Line 7** PMESSAGE 2: Prints the message defined as message number 2 in the Messages table. In this case, message number 2 is defined as the format symbol |T. This causes a date stamp and time stamp to be printed in the format:
- Wednesday April 24, 2002 15:22:34
- Line 8** SKIP 1: Skips 1 line on the serial printer form
- Line 9** TEST: Performs a complete scan of the MAIN Netlist for continuity and shorts
- Line 10** SKIP 1: Skips 1 line in the serial printer form
- Line 11** REPORT: Displays and prints a summary report.
- Line 12** PAGE: Advances the serial printer to the top of the next page
- Line 13** AUTO: Performs a continuous scan for continuity, looking for all harness connections to be open. Once all connections are open, the Analyzer continues execution with the next Sequence item. AUTO is used to determine that a harness has been completely removed from the fixture.
- Line 14** REPEAT: Repeats the Sequence starting at Line 1

Here are some example reports generated by the Sequence shown above:

Output for a good harness:



Output for a defective harness:



Print a report only when selected as a menu option

The previous example Sequence shows how to print a report for every harness. This approach has some potential drawbacks:

- Most harnesses will have no defects, yet a report is printed for them. There may be no particular use for these reports.
- Errors are printed as soon as they occur. If the errors are subsequently fixed by the operator, the harness will pass all tests, yet the printed report will show errors that actually have been cleared.
- The approach is only appropriate if the testing philosophy is *build first, then test*.

An alternate approach is to only print a report when the harness is truly defective. The following example Sequence illustrates how to program the Analyzer to offer a menu with two choices: TEST or PRINT. If the operator chooses TEST, the Analyzer will perform the harness tests, displaying error information and summary reports, but will not send any information to the printer. If a harness is defective and the error conditions cannot be fixed, the operator can execute the PRINT choice, causing the Analyzer to perform the harness tests and send the results to the printer.

Example Sequence to print a report only when selected from a menu

Line	Command	Parameter	Application Effect
1	MENU	0	Displays a menu as defined in message number 0: SELECT OPTION: TEST PRINT
2	SWITCH		Go to CASE label matching holding value
3	CASE	1	Label for Holding Value = 1 (Selection is TEST)
4	TEST	MAIN	Complete scan of MAIN Netlist
5	SCOUNT++		Increment Sequence counter, SCOUNT
6	REPORT		Displays "Assembly OK" if harness passes all tests, or displays error summary
7	KWAIT		Waits for operator to press START button
8	GOTO	1	Go to Line 1
9	CASE	2	Label for Holding Value = 2 (Selection is PRINT)
10	STOPOFF		Analyzer will not stop on errors – test scan is uninterrupted
11	PRINT		Enable automatic printing of errors
12	PAGESIZE	29	Sets number of printable lines in the form
13	FORMSIZE	33	Sets the number of lines in the form
14	PROGRAM		Prints the Program Name, Unit ID, and Sequence Counter value
15	PMESSAGE	2	Prints message 2 (Date stamp)
16	SKIP	1	Sends line feed character(s) out serial port
17	TEST	MAIN	Performs a complete scan of the MAIN Netlist
18	SKIP	1	Sends line feed character(s) out serial port
19	REPORT		Displays and prints "Assembly OK" if harness passes all tests, or displays and prints error summary
20	PAGE		Advances serial printer output to top of next form
21	PRINTOFF		Disable automatic printing of errors
22	STOP		Stop scan and display on error
23	GOTO	1	Go to Line 1

Line 1 The MENU Sequence item displays a menu using the message text associated with the message number specified as the parameter – in this case, 0. Message 0's text is defined as:

SELECT OPTION: TEST PRINT

This causes the menu and selections to be displayed by the Analyzer as follows:

SELECT OPTION >TEST PRINT

The operator uses the DOWN and UP buttons to place the cursor next to the desired option. Once the cursor is next to the desired option, the operator presses the START button to make the selection.

If the operator selects the first option (TEST), the Analyzer's holding register is set to 1. If the operator selects the second option (PRINT), the holding register is set to 2

- Line 2** SWITCH causes execution to branch to the CASE label corresponding to the value of the holding register. In this situation, execution branches to Line 3 if the operator selected TEST (holding register = 1), or to Line 9 if the operator selected PRINT (holding register = 2)
- Line 3** CASE – since the parameter is 1, this is the CASE label to which execution branches when the holding register = 1. This is where execution resumes when the operator selects TEST
- Line 4** TEST performs a series of scans on the Netlist specified by the Parameter, in this case, MAIN
- Line 5** SCOUNT++: Increments the value of the Sequence counter. Note that in Line 14, the PROGRAM Sequence item prints the value of the Sequence counter. In this context, the Sequence counter is used to count the number of harnesses being tested
- Line 6** REPORT displays a summary report
- Line 7** KWAIT waits for the operator to press the START button
- Line 8** GOTO 1 causes execution of the Sequence to go back to Line 1
- Line 9** CASE – since the parameter is 2, this is the CASE label to which execution branches when the holding register = 2. This is where execution resumes when the operator selects PRINT.
- Line 10** STOPOFF instructs the Analyzer not to stop during a Netlist scan when an error is encountered.
- Line 11** PRINT causes any error messages and the REPORT summary to be sent to the serial port. Serial port number 2 is the default port. It is assumed that the Receipt Printer is connected to serial port number 2. (This can be changed by using the SERIAL1 Sequence item).

- Line 12** PAGESIZE 29 Sets the number of printable lines within the form to 29.
- Line 13** FORMSIZE 33 Sets the number of total lines on a printer form. FORMSIZE must be set to a greater value than PAGESIZE. The effect of the PAGESIZE and FORMSIZE parameters is to allow for a white space margin between each harness's output report.
- Line 14** PROGRAM: Prints a report header line. The line contains the Program Name, Unit ID, and Sequence Counter value.
- Line 15** PMESSAGE 2: Prints the message defined as message number 2 in the Messages table. In this case, message number 2 is defined as the format symbol |T. This causes a date stamp and time stamp to be printed in the format:
- Wednesday April 24, 2002 15:22:34¹
- Line 16** SKIP 1: Skips 1 line on the serial printer form
- Line 17** TEST: Performs a complete scan of the MAIN Netlist for continuity and shorts
- Line 18** SKIP 1: Skips 1 line in the serial printer form
- Line 19** REPORT: Prints a summary report.
- Line 20** PAGE: Advances the serial printer to the top of the next page
- Line 21** PRINTOFF disables the automatic printing of errors.
- Line 22** STOP instructs the Analyzer to stop on error and display the error information. This is the default behavior of the Analyzer.
- Line 23** GOTO 1 causes execution of the Sequence to go back to Line 1

¹ For more information about format symbols, refer to the PASS 6.0 Help File, *Message Command Format Symbols*

The Sequence above makes use of the MENU, SWITCH, and CASE Sequence items. The following flowchart illustrates the use of these items to provide a menu of choices, evaluate the user's choice, and branch to the appropriate case.

