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Winter 98-99

EE384A: Network Protocols and Standards
Homework #4
OSPF
Due Date: Tuesday February 23, 1999

This homework assignment relates to the OSPF routing protocol as described by RFC 2328. You are asked to familiarize yourself with its content as the questions in this assignment refer to the sample network depicted in Figures 2 and 6 of the document; for your convenience, the figures have been attached to this assignment[1]. It is highly recommended that you type your solution for this assignment, as it will help reduce the time needed to write it.

1. Consider first the network depicted in Figure 2 of RFC 2328. This figure represents an autonomous system in which there are no configured areas. For the broadcast networks in the figure, consider that the designated routers are:

Network	Designated Router
N_3	RT4
N_6	RT10
N_8	RT11
N_9	RT11

The IP network addresses for the various networks are given below; these are consistent with the assignments in Figure 15:

Network	IP Address
N_1	192.1.2
N_2	192.1.3
N_3	192.1.1
N_4	192.1.4
N_6	192.1.5
N_7	192.1.6
N_8	192.1.7
N_9	192.1.8
N_{10}	192.1.9
N_{11}	192.1.10

[1] We used the Postscript versions of the same figures from RFC 1583, but they are the same as the ASCII graphics in RFC 2328.

Assume that router interface IP addresses are assigned as follows: if router RTx has an interface to network 192.1.y, the interface IP address is 192.1.y.x. For example, router RT4 has an IP address of 192.1.1.4 for its interface to network N_3.

a. Give the link state advertisements issued by router RT10. Follow the format used in the RFC document, Section 12; a sample can be found in pages 132 and 133. Only the default TOS=0 metrics are considered in this problem.
b. Draw the SPF tree for router RT10 (similarly to the one shown in Figure 5 for RT6).
c. Give the routing table for router RT10 (similarly to that given in Table 12 of the RFC for RT6).

2. Consider now that the autonomous system is divided into areas as shown in Figure 6.

a. Give the link state advertisements issued by RT10, following the notation and format used in Section 12.
b. Present in table form the database for all three areas and the backbone (similarly to Figures 7 and 8)[2].
c. Draw the SPF trees for routers RT10.
d. Give the routing tables for routers RT10.

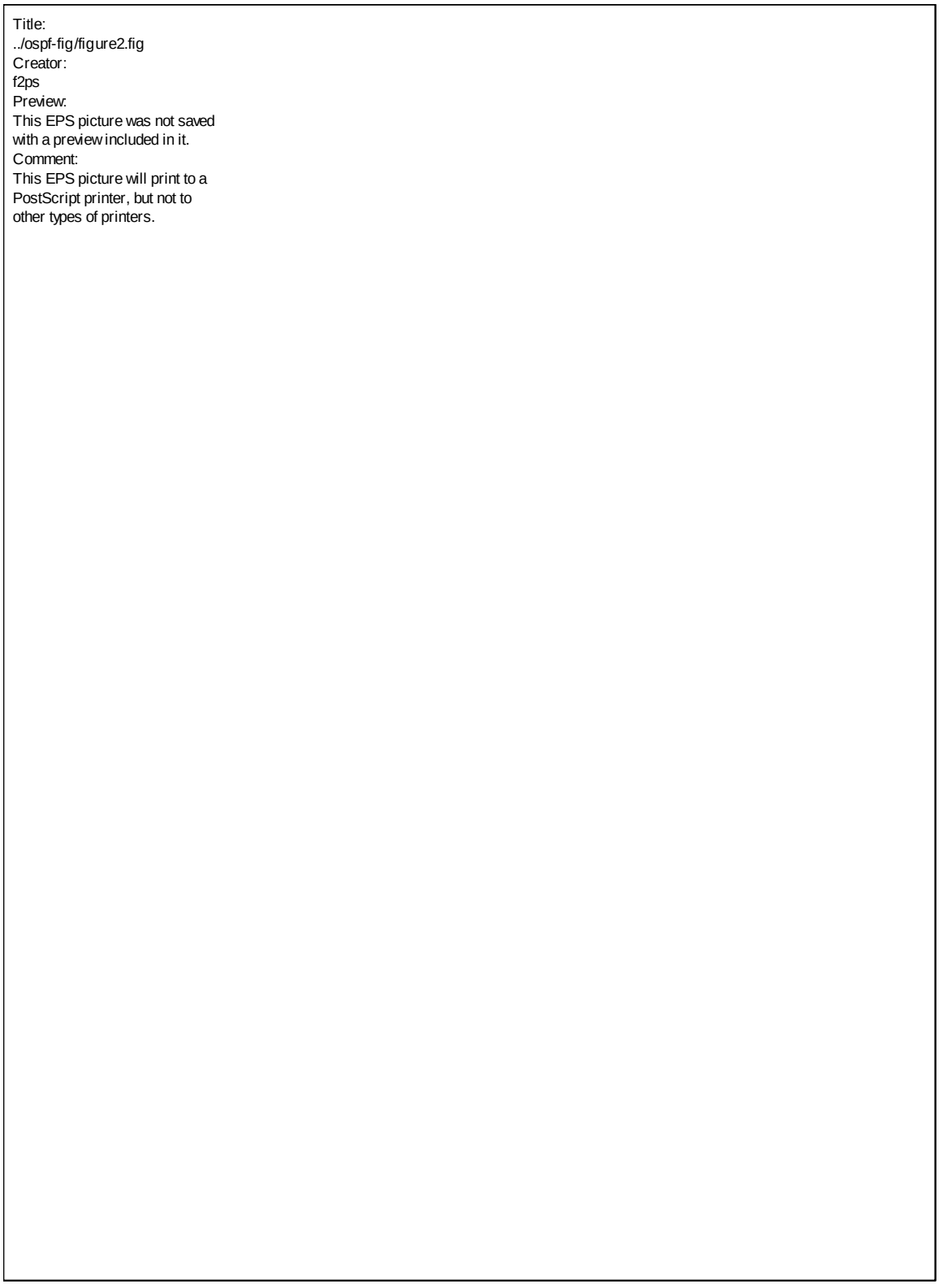
The class Web page has a link to RFC 2328, but here it is again:

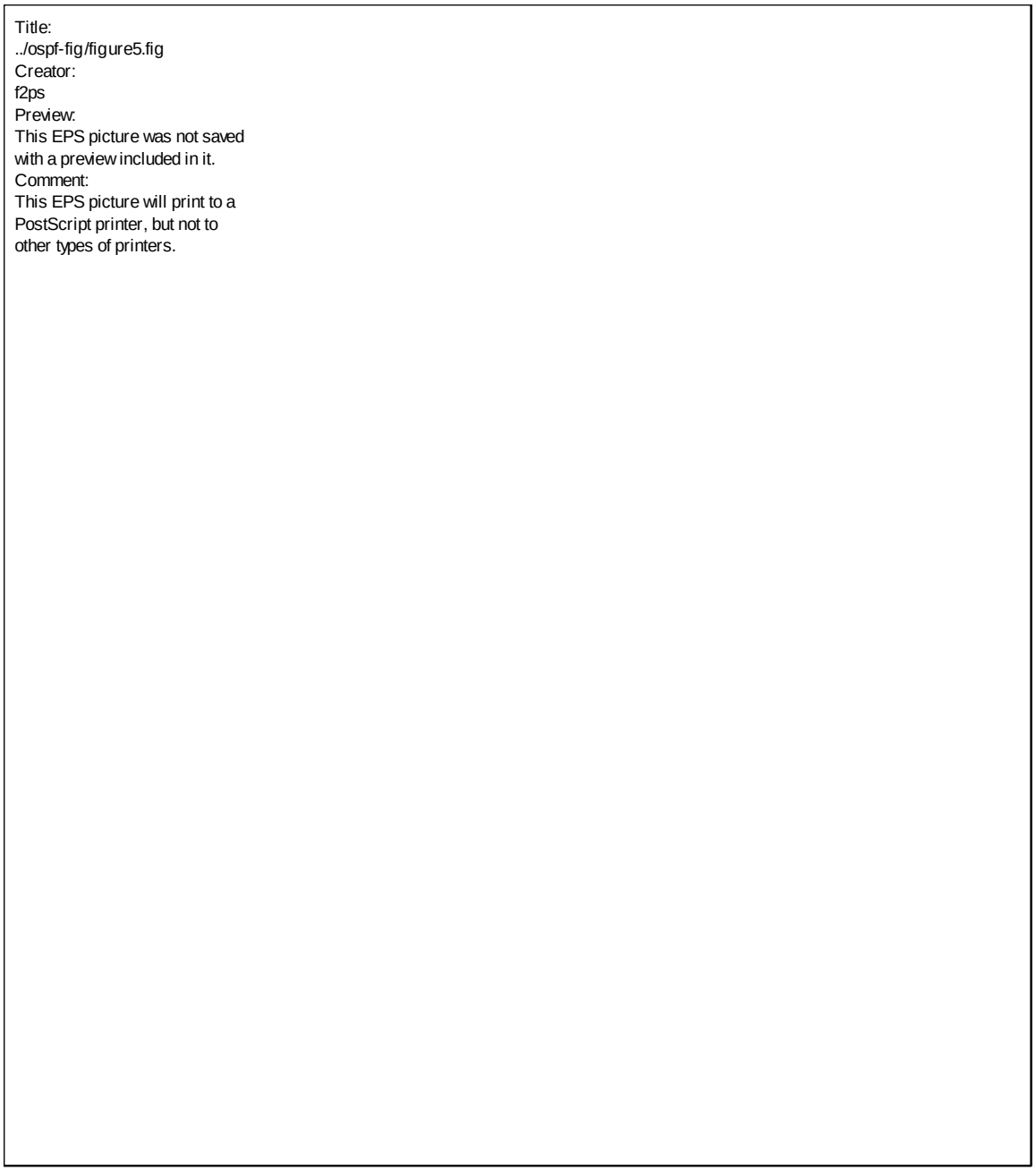
ftp://ftp.merit.edu/internet/documents/rfc/rfc2328.txt

[2] We have appended these in graph form from RFC 1583 as a reference; in your solution, use the table format from RFC 2328.

Reference: RFC Figures

The figures reproduced here are from RFC 1583 (because they look better). The networks are the same between RFC 1583 and 2328.

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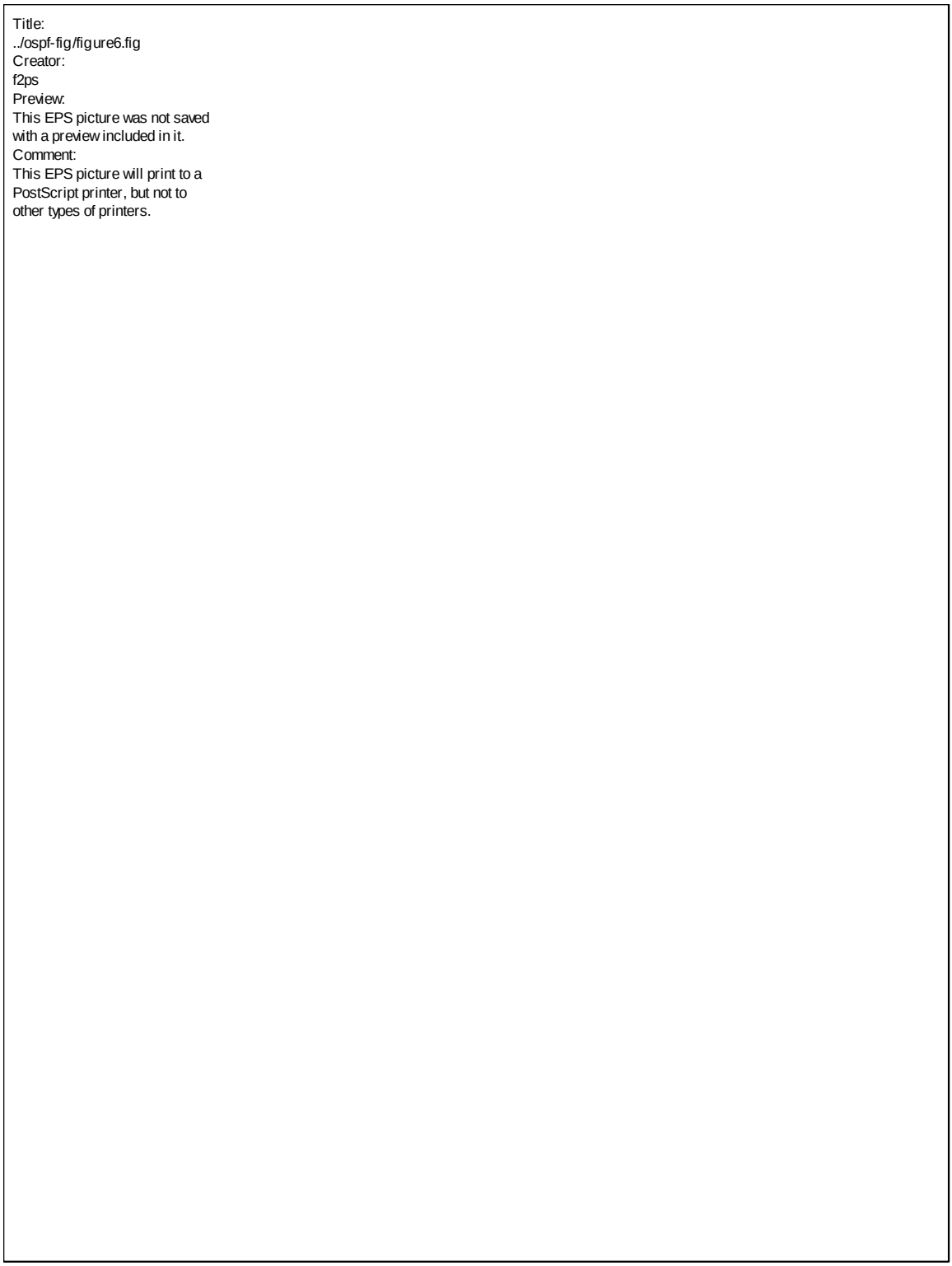
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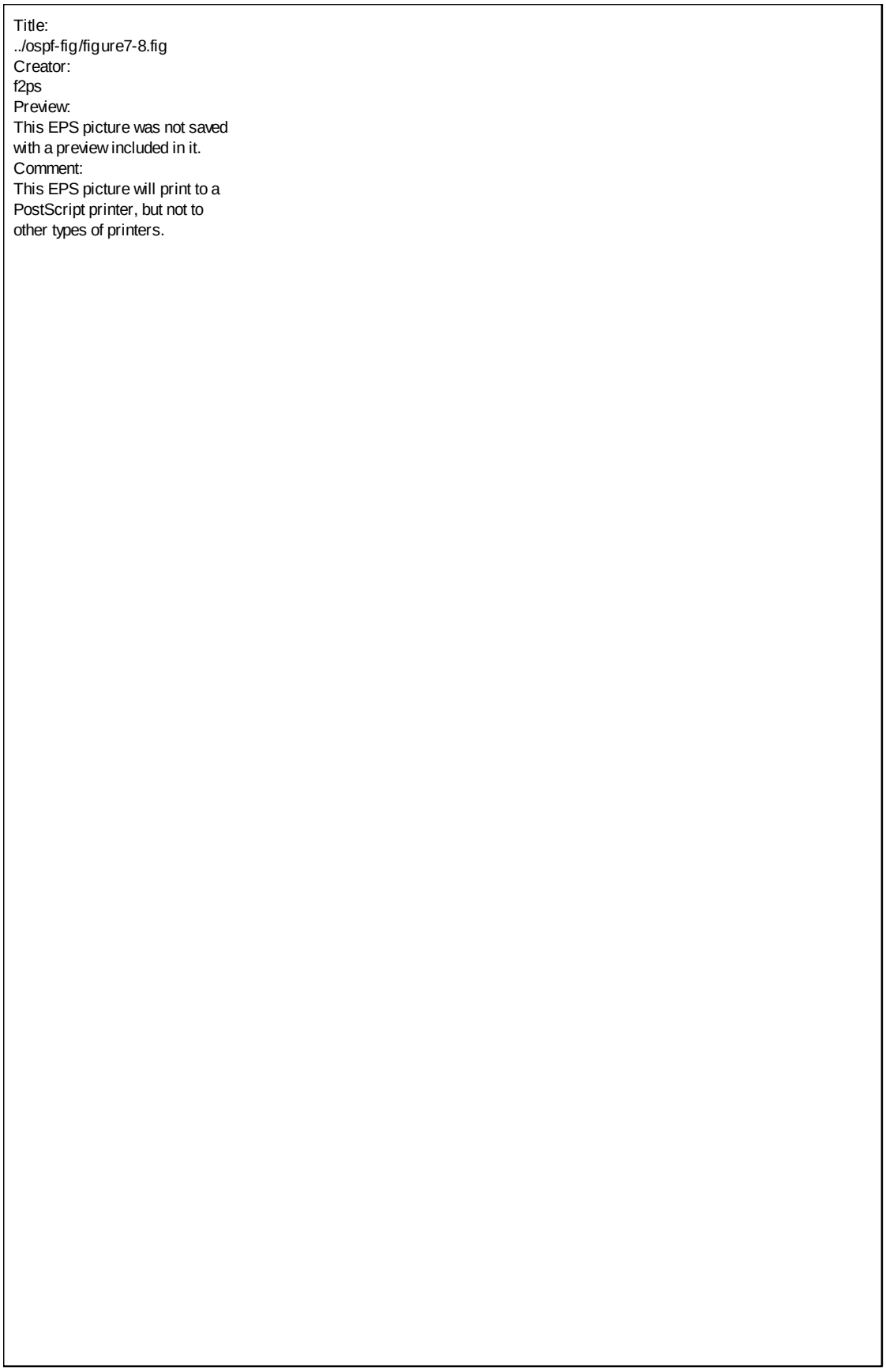
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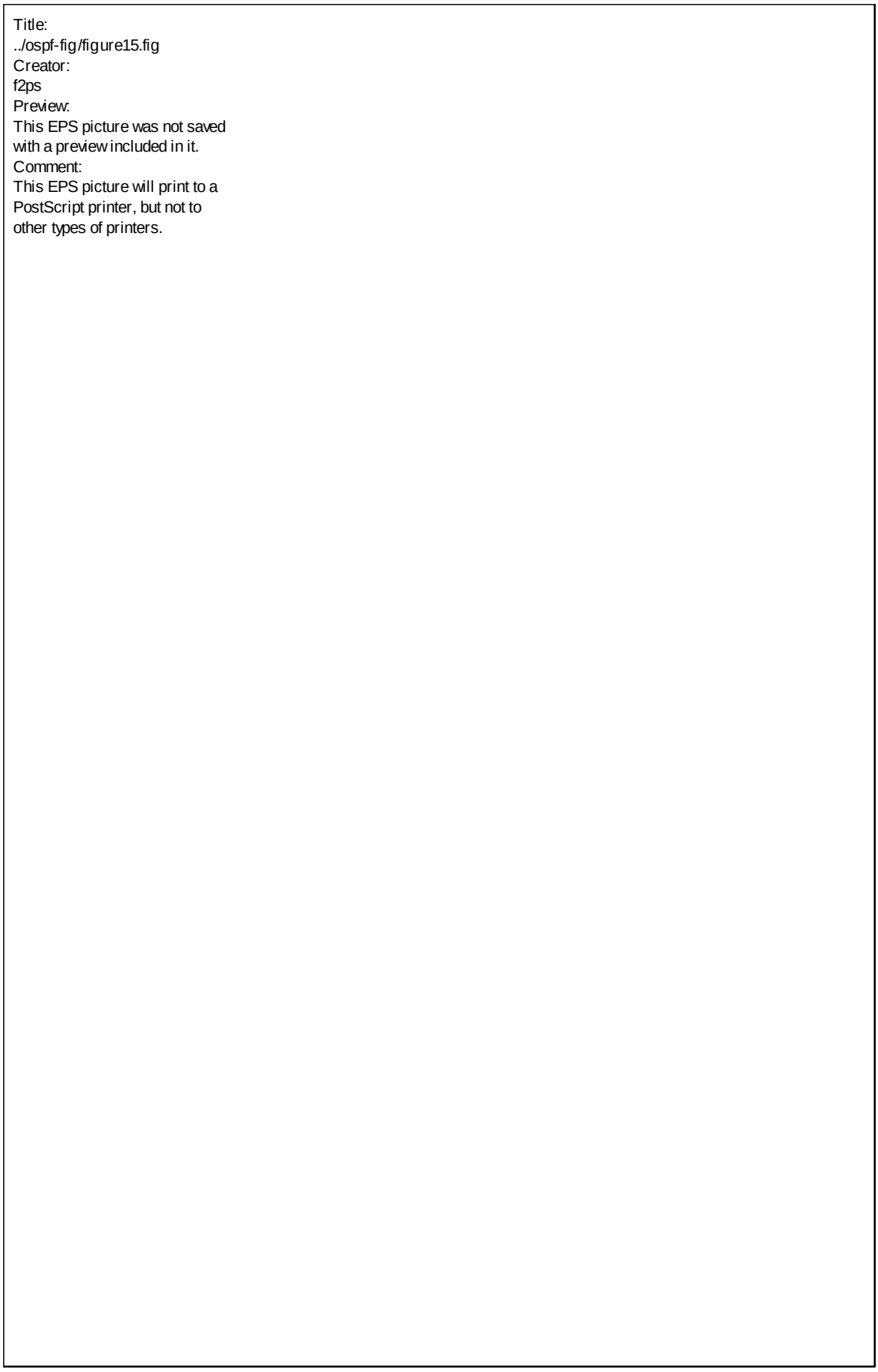
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