SPIRENT COMMUNICATIONS PLC Form 6-K August 29, 2006

> UNITED STATES SECURITIES AND EXCHANGE COMMISSION Washington, D.C. 20549

> > FORM 6-K

REPORT OF FOREIGN PRIVATE ISSUER PURSUANT TO RULE 13a-16 OR 15d-16 UNDER THE SECURITIES EXCHANGE ACT OF 1934

For the month of August, 2006

SPIRENT COMMUNICATIONS plc

(Translation of registrant's name into English)

Spirent House, Crawley Business Quarter, Fleming Way, Crawley, West Sussex RH10 9QL, UK.

(Address of principal executive offices)

Indicate by check mark whether the registrant files or will file annual reports under cover Form 20-F or Form 40-F.

Form 20-F X Form 40-F....

Indicate by check mark whether the registrant by furnishing the information contained in this Form is also thereby furnishing the information to the Commission pursuant to Rule 12g3-2(b) under the Securities Exchange Act of 1934.

Yes No X

If "Yes" is marked, indicate below the file number assigned to the registrant in connection with Rule 12g3-2(b): 82-

Spirent Communications plc announces that on 29 August 2006 it purchased from JPMorgan Cazenove Limited 1,000,000 Spirent Communications plc ordinary shares at an average price of 46.4678 pence per share. The purchased shares will be held as treasury shares. Following the above purchase, Spirent Communications plc holds 48,990,000 Spirent Communications plc ordinary shares in treasury, and has 922,943,953 Spirent Communications plc ordinary shares in issue (excluding treasury shares).

Signatures

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Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

_____MICHAEL ANSCOMBE_____

(Registrant)

Date ____ 29 August, 2006

By ____/s/ Michael Anscombe_____

(Signature)*