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PIONEER MUNICIPAL HIGH INCOME TRUST
Form N-Q
September 28, 2006

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

FORM N-Q

CERTIFIED SHAREHOLDER REPORT OF REGISTERED
MANAGEMENT INVESTMENT COMPANIES

Investment Company Act file number 811-21321

Pioneer Municipal High Income Trust
(Exact name of registrant as specified in charter)

60 State Street, Boston, MA 02109
(Address of principal executive offices) (ZIP code)

Dorothy E. Bourassa, Pioneer Investment Management, Inc.,
60 State Street, Boston, MA 02109
(Name and address of agent for service)

Registrant's telephone number, including area code: (617) 742-7825

Date of fiscal year end: April 30

Date of reporting period: July 31, 2006

Form N-Q is to be used by management investment companies, other than small business investment companies registered on Form N-5 (239.24 and 274.5 of this chapter), to file reports with the Commission, not later than 60 days after close of the first and third fiscal quarters, pursuant to Rule 30b1-5 under the Investment Company Act of 1940 (17 CFR 270.30b-5). The Commission may use the information provided on Form N-Q in its regulatory, disclosure review, inspection, and policymaking roles.

A registrant is required to disclose the information specified by Form N-Q, and the Commission will make this information public. A registrant is not required to respond to the collection of information contained in Form N-Q unless the Form displays a currently valid Office of Management and Budget ("OMB") control number. Please direct comments concerning the accuracy of the information collection burden estimate and any suggestions for reducing the burden to Secretary, Securities and Exchange Commission, 450 Fifth Street, NW, Washington, DC 20549-0609. The OMB has reviewed this collection of information under the clearance requirements of 44 U.S.C. ss. 3507.

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ITEM 1. Schedule of Investments.

Pioneer Municipal High Income Trust

SCHEDULE OF INVESTMENTS 7/31/06 (unaudited)

Principal Amount		Value
	TAX EXEMPT OBLIGATIONS - 128.0% of Net Assets	
	Alabama - 0.5%	
1,500,000	Camden Alabama Industrial Development Board, 6.125%, 1	\$1,624,710
	Arizona - 6.5%	
5,000,000	Apache County Industrial Development Authority, 5.85%	\$5,002,000
5,000,000	Apache County Industrial Development Authority, 5.875%	5,002,100
7,000,000	(a)Downtown Phoenix Hotel Corp., RIB, 6.103%, 7/1/40 (144	7,357,630
3,000,000	+ Maricopa County Industrial Development Authority, 7.87	3,132,690
1,000,000	Pima County Industrial Development Authority, 7.25%, 7	1,072,200
500,000	Yavapai County Industrial Development Authority, 6.0%,	531,655
		\$22,098,275
	California - 10.8%	
7,270,000	California State General Obligation, 5.25%, 2/1/28	\$7,581,011
5,000,000	California Statewide Communities Development Authority	5,078,000
5,150,000	Golden State Tobacco Securitization Corp., 7.8%, 6/1/4	6,156,516
7,000,000	Golden State Tobacco Securitization Corp., 7.875%, 6/1	8,398,670
2,000,000	San Diego Unified School District, 5.0%, 7/1/25	2,085,040
2,500,000	University of California Revenue, 5.0%, 5/15/25	2,580,075
5,000,000	Valley Health System Hospital Revenue, 6.5%, 5/15/25	5,006,050
		\$36,885,362
	Connecticut - 4.0%	
2,000,000	Bridgeport Senior Living Facility Revenue, 7.25%, 4/1/	\$1,506,120
2,205,000	Connecticut State Health & Educational Facilities Auth	2,222,927
4,800,000	Connecticut State Health & Educational Facilities Auth	4,782,048
5,000,000	Mohegan Tribe Indians Gaming Authority, 6.25%, 1/1/31	5,311,400
		\$13,822,495
	Delaware - 0.3%	
500,000	Sussex County Delaware Revenue, 5.9%, 1/1/26	\$509,735
600,000	Sussex County Delaware Revenue, 6.0%, 1/1/35	611,628
		\$1,121,363
	District of Columbia - 3.6%	
5,000,000	District of Columbia Tobacco Settlement Financing Corp	\$5,688,400
6,000,000	District of Columbia Tobacco Settlement Financing Corp	6,518,400
		\$12,206,800
	Florida - 2.8%	
2,000,000	Beacon Lakes Community Development, 6.9%, 5/1/35	\$2,172,100
1,650,000	Polk County Industrial Development Revenue, 5.85%, 12/	1,680,657
5,500,000	Tallahassee Health Facilities Revenue, 6.375%, 12/1/30	5,843,695
		\$9,696,452
	Georgia - 2.0%	
4,240,000	(a)Atlanta Georgia Water & Waste Revenue, RIB, 6.193%, 11	\$4,502,541
2,325,000	Brunswick & Glynn County Development Authority Revenue	2,291,241
		\$6,793,782
	Idaho - 1.6%	
5,000,000	Power County Industrial Development Corp., 6.45%, 8/1/	\$5,324,100
	Illinois - 5.9%	
1,000,000	Centerpoint Intermodal Center, 8.0%, 6/15/23 (144A)	\$1,010,200
5,000,000	Chicago Illinois O'Hare International Airport Revenue,	5,124,350

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1,000,000	Illinois Finance Authority Revenue, 6.0%, 11/15/27	1,007,520
1,000,000	Illinois Finance Authority Revenue, 6.0%, 11/15/39	1,000,350
1,500,000	Illinois Health Facilities Authority Revenue, 6.9%, 11	1,632,765
16,880,000	(b)Metropolitan Pier & Exposition Authority Dedicated Sta	10,520,798
		\$20,295,983
	Indiana - 1.6%	
1,000,000	Indiana State Development Finance Authority Revenue, 5	\$1,028,800
4,300,000	Indiana State Development Finance Authority Revenue, 5	4,439,965
		\$5,468,765

Pioneer Municipal High Income Trust

SCHEDULE OF INVESTMENTS 7/31/06 (unaudited) (continued)

Principal Amount		Value
	Massachusetts - 11.1%	
5,000,000	Massachusetts Bay Transportation Authority, 5.0%, 7/1/	\$5,364,250
2,335,000	Massachusetts Health & Educational Facilities Authorit	2,402,995
7,050,000	Massachusetts Health & Educational Facilities Authorit	7,306,972
3,500,000	Massachusetts Health & Educational Facilities Authorit	3,742,095
5,000,000	Massachusetts Health & Educational Facilities Authorit	5,417,900
75,000	Massachusetts State Development Finance Agency, 5.25%,	69,270
9,810,000	(a)Massachusetts State Development Finance Agency, RIB,	610,633,255
3,055,000	Massachusetts State Housing Finance Agency, 5.25%, 12/	3,102,078
		\$38,038,815
	Michigan - 3.6%	
1,500,000	John Tolfree Health System Corp., 6.0%, 9/15/23	\$1,523,520
2,000,000	Michigan State Hospital Finance Authority Revenue, 5.5	1,927,160
4,010,000	Michigan State Hospital Finance Authority Revenue, 6.0	4,010,802
7,720,000	(c)Wayne Charter County Michigan Special Airport Faciliti	4,800,296
		\$12,261,778
	Minnesota - 2.3%	
1,675,000	Duluth Economic Development Authority Health Care Faci	\$1,787,811
8,760,000	(c)Minneapolis/St. Paul Metropolitan Airports, 7.0%, 4/1/	6,013,565
		\$7,801,376
	Mississippi - 0.9%	
3,000,000	Mississippi Business Finance Corp. Pollution Control R	\$3,009,210
	Missouri - 1.5%	
5,500,000	St. Louis Industrial Development Authority Revenue, 7.	\$5,166,810
	Montana - 0.5%	
1,600,000	Two Rivers Authority, Inc. Correctional Facility Impro	\$1,556,816
	Nevada - 1.4%	
1,000,000	Clark County Industrial Development Revenue, 5.45%, 3/	\$1,047,770
1,850,000	Clark County Industrial Development Revenue, 5.5%, 10/	1,824,784
2,000,000	Nevada State Department of Business & Industry, 7.25%,	2,037,960
		\$4,910,514
	New Hampshire - 0.9%	
3,000,000	Manchester School Facilities Revenue, 5.125%, 6/1/28	\$3,118,530
	New Jersey - 10.1%	
2,000,000	New Jersey Economic Development Authority Revenue, 6.2	\$2,045,440
13,350,000	New Jersey Economic Development Authority Revenue, 6.2	13,643,833
1,000,000	New Jersey Economic Development Authority Revenue, 6.4	1,026,340
6,150,000	New Jersey Economic Development Authority Revenue, 7.0	6,443,109
10,000,000	Tobacco Settlement Financing Corp., 6.75%, 6/1/39	11,216,500
		\$34,375,222

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	New Mexico - 0.4%	
1,350,000	Santa Fe Educational Facilities Revenue, 5.75%, 10/1/2	\$1,404,257
	New York - 8.8%	
2,000,000	New York City Industrial Development Agency, 5.375%, 6	\$2,058,720
6,225,000	New York City Industrial Development Agency, 6.9%, 8/1	6,209,126
5,000,000	New York City Trust Cultural Resources Revenue, 5.125%	5,163,200
7,040,000	(a) New York State Dormitory Authority Revenue, RIB, 6.41%	8,275,520
2,000,000	Suffolk County Industrial Development Agency, 7.25%, 1	2,046,400
6,000,000	Triborough Bridge & Tunnel Authority Revenue, 5.25%, 1	6,303,240
		\$30,056,206
	North Carolina - 2.6%	
4,030,000	Charlotte North Carolina Special Facilities Revenue, 5	\$3,979,464
4,600,000	Charlotte North Carolina Special Facilities Revenue, 7	4,932,764
		\$8,912,228

Pioneer Municipal High Income Trust

SCHEDULE OF INVESTMENTS 7/31/06 (unaudited) (continued)

Principal Amount		Value
	Oklahoma - 6.3%	
3,000,000	+ Oklahoma Development Finance Authority Revenue, 5.625%	\$3,178,890
8,000,000	+ Oklahoma Development Finance Authority Revenue, 5.625%	8,477,040
4,100,000	Tulsa Municipal Airport Revenue, 5.65%, 12/1/35	4,113,653
1,225,000	Tulsa Municipal Airport Revenue, 6.25%, 6/1/20	1,227,916
4,350,000	Tulsa Municipal Airport Revenue, 7.35%, 12/1/11	4,349,217
		\$21,346,716
	Oregon - 4.3%	
1,000,000	Klamath Falls Electric Revenue, 5.75%, 1/1/13	\$928,730
7,000,000	Klamath Falls Electric Revenue, 6.0%, 1/1/25	6,282,500
7,500,000	Western Generation Agency Cogeneration Project Revenue	7,525,725
		\$14,736,955
	Pennsylvania - 5.8%	
1,550,000	Allegheny County Hospital Development Authority Revenue	\$1,522,767
12,300,000	Allegheny County Hospital Development Authority Revenue	14,534,910
1,000,000	Columbia County Hospital Authority Health Care Revenue	882,220
1,000,000	Hazleton Health Services Authority Hospital Revenue, 5	978,040
1,280,000	Langhorne Manor Borough Higher Education & Health Auth	1,280,115
500,000	Pennsylvania Higher Educational Facilities Authority R	517,490
		\$19,715,542
	Rhode Island - 1.3%	
4,000,000	Central Falls Detention Facilities Revenue, 7.25%, 7/1	\$4,406,000
	South Carolina - 2.9%	
3,000,000	+ Greenville County School District, 5.5%, 12/1/28	\$3,286,860
5,185,000	+ South Carolina Jobs Economic Development Authority Rev	5,937,188
665,000	South Carolina Jobs Economic Development Authority Rev	739,586
		\$9,963,634
	Tennessee - 3.8%	
7,000,000	Johnson City Health & Educational Facilities Board Hos	\$8,094,100
4,480,000	Knox County Health Educational & Housing Facilities Bo	4,837,638
		\$12,931,738
	Texas - 12.2%	
7,500,000	Alliance Airport Authority Special Facilities Revenue,	\$7,537,575
1,345,000	Bexar County Housing Finance Corp., 8.0%, 12/1/36	1,368,564
1,000,000	Dallas-Fort Worth International Airport Revenue, 6.0%,	990,680
5,000,000	Dallas-Fort Worth International Airport Revenue, 6.15%	5,013,350
4,000,000	Decatur Hospital Authority Revenue, 7.0%, 9/1/25	4,319,360
1,000,000	+ Georgetown Health Facilities Development Corp., 6.25%,	1,080,600

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3,750,000	Houston Airport System Special Facilities Revenue, 5.7	3,610,650
5,340,000	Lubbock Health Facilities Development Corp., 6.625%, 7	5,434,625
2,450,000	(a)Northside Independent School District, RIB, 6.604%, 6/	2,711,047
500,000	Sabine River Authority Pollution Control Revenue, 6.15	539,575
7,040,000	(a)Texas State, RIB, 6.077%, 4/1/30 (144A)	7,709,082
1,500,000	Willacy County Local Government Corp. Revenue, 6.0%, 3	1,518,825
		\$41,833,933
	Vermont - 0.5%	
1,500,000	Vermont Educational & Health Buildings Financing Agenc	\$1,656,915
	Virginia - 1.5%	
1,000,000	Peninsula Ports Authority, 6.0%, 4/1/33	\$1,062,960
4,000,000	+ Pocahontas Parkway Association of Virginia Toll Road R	4,208,640
		\$5,271,600
	Washington - 5.7%	
4,710,000	Spokane Public Facilities District Hotel/Motel Tax & S	\$5,142,143
7,025,000	Tobacco Settlement Authority Revenue, 6.625%, 6/1/32	7,654,159
14,315,000	Washington State General Obligation, 0.0%, 6/1/22	6,765,412
		\$19,561,714
	TOTAL TAX-EXEMPT OBLIGATIONS	
	(Cost \$397,630,910)	\$437,374,596

Pioneer Municipal High Income Trust

SCHEDULE OF INVESTMENTS 7/31/06 (unaudited) (continued)

Shares	TAX-EXEMPT MONEY MARKET MUTUAL FUND - 0.3% of Net Assets	
1,080,401	BlackRock Provident Institutional Municipal Fund	\$1,080,401
	TOTAL TAX-EXEMPT MONEY MARKET MUTUAL FUND	
	(Cost \$1,080,401)	\$1,080,401
	TOTAL INVESTMENTS IN SECURITIES - 128.3%	
	(Cost \$398,711,311) (d) (e)	\$438,454,997
	OTHER ASSETS AND LIABILITIES - 1.3%	\$4,275,134
	PREFERRED SHARES AT REDEMPTION VALUE,	
	INCLUDING DIVIDENDS PAYABLE - (29.6)%	
\$ (101,050,559)		
	NET ASSETS APPLICABLE TO COMMON SHAREOWNERS - 100.0%	\$341,679,572

NR Security not rated by S&P or Moody's.

(144A) Security is exempt from registration under Rule 144A of the Securities Act of 1933. Such securities may be resold normally to qualified institutional buyers in a transaction exempt from registration. At July 31, 2006 the value of these securities amounted to \$42,199,275 or 12.4% of net assets applicable to common shareowners.

+ Prerefunded bonds have been collateralized by U.S. Treasury securities which are held in escrow to pay interest and principal on the tax exempt issue and to retire the bonds in full at the earliest refunding date.

(a) The interest rate is subject to change periodically and inversely based upon prevailing market rates. The interest rate shown was the rate at July 31, 2006.

(b) Debt obligation initially issued at one coupon which converts to a

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higher coupon at a specific date.

The rate shown is the rate at period end.

(c) Security is in default and is non-income producing.

(d) At July 31, 2006, the net unrealized gain on investments based on cost for federal income tax purposes of \$397,221,262 was as follows:

Aggregate gross unrealized gain for all investments in which there is an excess of value over tax cost	48,144,789
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Aggregate gross unrealized loss for all investments in which there is an excess of tax cost over value	-6,911,054
Net unrealized gain	41,233,735

For financial reporting purposes net unrealized gain on investments was \$39,743,686 and cost of investments aggregated \$398,711,311

RIB Residual Interest Bonds

ITEM 2. CONTROLS AND PROCEDURES.

(a) Disclose the conclusions of the registrant's principal executive officer or officers and principal financial officer or officers, or persons performing similar functions, about the effectiveness of the registrant's disclosure controls and procedures (as defined in Rule 30a-3(c) under the Act (17 CFR 270.30a-3(c))) as of a date within 90 days of the filing date of the report that includes the disclosure required by this paragraph, based on their evaluation of these controls and procedures required by Rule 30a-3(b) under the Act (17 CFR 270.30a-3(b)) and Rule 13a-15(b) or 15d-15(b) under the Exchange Act (17 CFR 240.13a-15(b) or 240.15d-15(b)).

The registrant's principal executive officer and principal financial officer have concluded that the registrant's disclosure controls and procedures are effective based on their evaluation of these controls and procedures as of a date within 90 days of the filing date of this report.

(b) Disclose any change in the registrant's internal controls over financial reporting (as defined in Rule 30a-3(d) under the Act (17 CFR 270.30a-3(d))) that occurred during the registrant's last fiscal quarter that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting.

There were no significant changes in the registrant's internal control over financial reporting that occurred during the second fiscal quarter of the period covered by this report that have materially affected, or are reasonably likely to materially affect, the registrant's internal control over financial reporting.

The registrant's principal executive officer and principal financial officer, however, voluntarily are reporting the following information:

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In August of 2006 the registrant's investment adviser enhanced its internal procedures for reporting performance information required to be included in prospectuses. Those enhancements involved additional internal controls over the appropriateness of performance data generated for this purpose. Such enhancements were made following an internal review which identified prospectuses relating to certain classes of shares of a limited number of registrants where, inadvertently, performance information not reflecting the deduction of applicable sales charges was included. Those prospectuses were revised, and the revised prospectuses were distributed to shareholders.

ITEM 3. EXHIBITS.

(a) A separate certification for each principal executive officer and principal financial officer of the registrant as required by Rule 30a-2 under the Act (17 CFR 270.30a-2).

Filed herewith.

SIGNATURES

[See General Instruction F]

Pursuant to the requirements of the Securities Exchange Act of 1934 and the Investment Company Act of 1940, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

(Registrant) Pioneer Municipal High Income Trust

By (Signature and Title)* /s/ John F. Cogan, Jr.
John F. Cogan, Jr, President

Date September 29, 2006

Pursuant to the requirements of the Securities Exchange Act of 1934 and the Investment Company Act of 1940, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

By (Signature and Title)* /s/ John F. Cogan, Jr.
John F. Cogan, Jr., President

Date September 29, 2006

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By (Signature and Title)* /s/ Vincent Nave
Vincent Nave, Treasurer

Date September 29, 2006

* Print the name and title of each signing officer under his or her signature.