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PIONEER MUNICIPAL HIGH INCOME TRUST
Form N-Q
March 29, 2007

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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: January 31, 2007

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 1/31/07 (unaudited)

Principal Amount (\$)	Value
TAX EXEMPT OBLIGATIONS - 122.4%	
Alabama - 0.5%	
1,500,000	Camden Alabama Industrial Development Board, 6 \$ 1,637,490
Arizona - 6.4%	
5,000,000	Apache County Industrial Development Authority \$ 5,002,850
5,000,000	Apache County Industrial Development Authority 5,002,950
7,000,000 (a)	Downtown Phoenix Hotel Corp., RIB, 6.467%, 7/1 7,853,440
3,000,000	+Maricopa County Industrial Development Authori 3,078,150
1,000,000	Pima County Industrial Development Authority, 1,111,060
500,000	Yavapai County Industrial Development Authorit 538,075
	\$ 22,586,525
California - 10.6%	
7,270,000	California State General Obligation, 5.25%, 2/ \$ 7,713,034
5,000,000	California Statewide Communities Development A 5,215,700
5,150,000	Golden State Tobacco Securitization Corp., 7.8 6,256,168
7,000,000	Golden State Tobacco Securitization Corp., 7.8 8,532,720
2,000,000	San Diego Unified School District, 5.0%, 7/1/2 2,080,060
2,500,000	University of California Revenue, 5.0%, 5/15/2 2,622,050
5,000,000	Valley Health System Hospital Revenue, 6.5%, 5 5,033,050
	\$ 37,452,782
Connecticut - 3.5%	
2,205,000	Connecticut State Health & Educational Facilit \$ 2,248,615
4,800,000	Connecticut State Health & Educational Facilit 4,889,856
5,000,000	Mohegan Tribe Indians Gaming Authority, 6.25%, 5,313,900
	\$ 12,452,371
Delaware - 0.3%	
500,000	Sussex County Delaware Revenue, 5.9%, 1/1/26 \$ 526,370
600,000	Sussex County Delaware Revenue, 6.0%, 1/1/35 631,686
	\$ 1,158,056
District of Columbia - 3.6%	
5,000,000	District of Columbia Tobacco Settlement Financ \$ 5,960,150
6,000,000	District of Columbia Tobacco Settlement Financ 6,617,160
	\$ 12,577,310
Florida - 3.6%	
2,000,000	Beacon Lakes Community Development, 6.9%, 5/1/ \$ 2,183,680
1,650,000	Polk County Industrial Development Revenue, 5. 1,685,079
1,000,000	St. Johns County Industrial Development Author 1,009,880
2,000,000	St. Johns County Industrial Development Author 2,030,620
5,500,000	Tallahassee Health Facilities Revenue, 6.375%, 5,868,940
	\$ 12,778,199
Georgia - 2.7%	
4,240,000 (a)	Atlanta Georgia Water & Waste Revenue, RIB, 6. \$4,819,014
2,400,000	Fulton County Residential Care Facilities Reve 2,331,120
2,600,000	Fulton County Residential Care Facilities Reve 2,519,426
	\$ 9,669,560
Idaho - 1.5%	
5,000,000	Power County Industrial Development Corp., 6.4 \$ 5,311,500
Illinois - 6.5%	

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1,000,000	Centerpoint Intermodal Center, 8.0%, 6/15/23 (\$ 1,028,640
5,000,000	Chicago Illinois O'Hare International Airport	5,234,150
1,000,000	Illinois Finance Authority Revenue, 6.0%, 11/1	1,052,050
1,000,000	Illinois Finance Authority Revenue, 6.0%, 11/1	1,042,740
1,500,000	Illinois Health Facilities Authority Revenue,	1,655,625
16,880,00	(b)Metropolitan Pier & Exposition Authority Dedic	11,070,073
1,800,000	Southwestern Illinois Development Authority Re	1,818,666
		\$ 22,901,944
	Indiana - 1.5%	
1,000,000	Indiana State Development Finance Authority Re	\$ 1,033,030
4,300,000	Indiana State Development Finance Authority Re	4,454,112
		\$ 5,487,142
	Massachusetts - 10.8%	
5,000,000	Massachusetts Bay Transportation Authority, 5.	\$ 5,598,800
1,335,000	Massachusetts Health & Educational Facilities	1,378,508
7,050,000	Massachusetts Health & Educational Facilities	7,378,883
3,500,000	Massachusetts Health & Educational Facilities	3,771,635
5,000,000	Massachusetts Health & Educational Facilities	5,490,450
9,810,000	(a)Massachusetts State Development Finance Agency	11,338,104
3,055,000	Massachusetts State Housing Finance Agency, 5.	3,149,277
		\$ 38,105,657
	Michigan - 4.3%	
950,000	Dr. Charles Drew Academy, 5.7%, 11/1/36	\$ 939,702
1,500,000	John Tolfree Health System Corp., 6.0%, 9/15/2	1,538,055
2,000,000	Michigan State Hospital Finance Authority Reve	1,976,440
4,010,000	Michigan State Hospital Finance Authority Reve	4,011,724
7,720,000	(c)Wayne Charter County Michigan Special Airport	6,639,277
		\$ 15,105,198
	Minnesota - 0.5%	
1,675,000	Duluth Economic Development Authority Health C	\$ 1,850,858
	Mississippi - 0.9%	
3,000,000	Mississippi Business Finance Corp. Pollution C	\$ 3,031,680
	Montana - 0.5%	
1,600,000	Two Rivers Authority, Inc. Correctional Facili	\$ 1,642,368
	Nevada - 1.4%	
1,000,000	Clark County Industrial Development Revenue, 5	\$ 1,049,480
1,850,000	Clark County Industrial Development Revenue, 5	1,826,468
2,000,000	Nevada State Department of Business & Industry	2,121,040
		\$ 4,996,988
	New Hampshire - 0.9%	
3,000,000	Manchester School Facilities Revenue, 5.125%,	\$ 3,158,370
	New Jersey - 10.0%	
2,000,000	New Jersey Economic Development Authority Reve	\$ 2,079,200
13,350,000	New Jersey Economic Development Authority Reve	13,916,841
1,000,000	New Jersey Economic Development Authority Reve	1,047,870
6,150,000	New Jersey Economic Development Authority Reve	6,678,900
10,000,00	+Tobacco Settlement Financing Corp., 6.75%, 6/1	11,591,100
		\$ 35,313,911
	New Mexico - 0.4%	
1,350,000	+Santa Fe Educational Facilities Revenue, 5.75%	\$ 1,516,428
	New York - 8.7%	
2,000,000	New York City Industrial Development Agency, 5	\$ 2,100,280
6,225,000	New York City Industrial Development Agency, 6	6,288,495
5,000,000	New York City Trust Cultural Resources Revenue	5,236,600
7,040,000	(a)New York State Dormitory Authority Revenue, RI	8,706,509
2,000,000	Suffolk County Industrial Development Agency,	2,106,220
6,000,000	Triborough Bridge & Tunnel Authority Revenue,	6,404,880

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	\$30,842,984
North Carolina - 2.5%	
4,030,000	Charlotte North Carolina Special Facilities Re \$ 4,073,161
4,600,000	Charlotte North Carolina Special Facilities Re 4,939,572
	\$ 9,012,733
Ohio - 1.4%	
5,000,000	Hamilton County Health Care Revenue, 5.0%, 1/1 \$5,085,850
Oklahoma - 6.0%	
3,000,000	+Oklahoma Development Finance Authority Revenue \$ 3,160,020
8,000,000	+Oklahoma Development Finance Authority Revenue 8,426,720
4,100,000	Tulsa Municipal Airport Revenue, 5.65%, 12/1/3 4,172,119
1,225,000	Tulsa Municipal Airport Revenue, 6.25%, 6/1/20 1,229,447
4,350,000	Tulsa Municipal Airport Revenue, 7.35%, 12/1/1 4,365,269
	\$ 21,353,575
Pennsylvania - 5.6%	
1,550,000	Allegheny County Hospital Development Authorit \$ 1,553,503
12,300,000	Allegheny County Hospital Development Authorit 14,553,975
1,000,000	Columbia County Hospital Authority Health Care 913,490
1,000,000	Hazleton Health Services Authority Hospital Re 996,440
1,280,000	Langhorne Manor Borough Higher Education & Hea 1,280,371
500,000	Pennsylvania Higher Educational Facilities Aut 527,190
	\$ 19,824,969
Rhode Island - 1.3%	
4,000,000	Central Falls Detention Facilities Revenue, 7. \$ 4,481,560
South Carolina - 1.9%	
5,185,000	+South Carolina Jobs Economic Development Autho \$ 5,928,373
665,000	+South Carolina Jobs Economic Development Autho 756,245
	\$ 6,684,618
Tennessee - 3.6%	
7,000,000	Johnson City Health & Educational Facilities B \$ 8,108,940
4,480,000	Knox County Health Educational & Housing Facil 4,810,534
	\$ 12,919,474
Texas - 13.0%	
7,500,000	Alliance Airport Authority Special Facilities \$ 7,651,500
1,000,000	Austin Convention Enterprises, Inc. Revenue, 5 1,066,090
1,345,000	Bexar County Housing Finance Corp., 8.0%, 12/1 1,429,816
1,000,000	Dallas-Fort Worth International Airport Revenu 1,008,520
5,000,000	Dallas-Fort Worth International Airport Revenu 5,053,500
4,000,000	Decatur Hospital Authority Revenue, 7.0%, 9/1/ 4,380,680
1,000,000	+Georgetown Health Facilities Development Corp. 1,075,910
2,000,000	Gulf Coast Industrial Development Authority Re 2,102,580
3,750,000	Houston Airport System Special Facilities Reve 3,825,562
5,340,000	Lubbock Health Facilities Development Corp., 6 5,586,548
2,450,000	(a)Northside Independent School District, RIB, 6. 2,855,842
500,000	Sabine River Authority Pollution Control Reven 540,520
7,040,000	(a)Texas State, RIB, 6.456%, 4/1/30 (144A) 8,146,829
1,365,000	Willacy County Local Government Corp. Revenue, 1,382,199
	\$ 46,106,096
Utah - 0.2%	
800,000	Spanish Fork City Charter School Revenue, 5.55 \$ 796,312
Vermont - 0.5%	
1,500,000	Vermont Educational & Health Buildings Financi \$ 1,660,080
Virginia - 1.5%	
1,000,000	Peninsula Ports Authority, 6.0%, 4/1/33 \$ 1,080,790
4,000,000	+Pocahontas Parkway Association of Virginia Tol 4,185,360
	\$ 5,266,150
Washington - 5.8%	
4,710,000	Spokane Public Facilities District Hotel/Motel \$ 5,162,914

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7,025,000	Tobacco Settlement Authority Revenue, 6.625%,	7,845,731
14,315,000	Washington State General Obligation, 0.0%, 6/1	7,344,597
		\$ 20,353,242
	TOTAL TAX-EXEMPT OBLIGATIONS	
	(Cost \$380,963,992)	\$ 433,121,980
	MUNICIPAL COLLATERALIZED DEBT OBLIGATION - 2.8%	
10,000,000	Non-Profit Preferred Funding Trust I, Series E	\$ 9,974,600
	TOTAL MUNICIPAL COLLATERALIZED DEBT OBLIGATION	
	(Cost \$10,000,000)	\$ 9,974,600
Shares	TAX-EXEMPT MONEY MARKET MUTUAL FUND - 1.9%	
6,727,014	BlackRock Provident Institutional Municipal Fu	\$ 6,727,014
	TOTAL TAX-EXEMPT MONEY MARKET MUTUAL FUND	
	(Cost \$6,727,014)	\$ 6,727,014
	TOTAL INVESTMENTS IN SECURITIES - 127.1%	
	(Cost \$397,691,006) (d) (e)	\$ 449,823,594
	OTHER ASSETS AND LIABILITIES - 1.5%	\$ 5,158,691
	PREFERRED SHARES AT REDEMPTION VALUE,	
	INCLUDING DIVIDENDS PAYABLE - (28.6)%	\$ (101,038,753)
	NET ASSETS APPLICABLE TO COMMON	
	SHAREOWNERS - 100.0%	\$ 353,943,532

(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 January 31, 2007 the value of these securities amounted to \$50,858,590 or 14.4% 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 is the rate at January 31, 2007.

(b) Debt obligation initially issued at one coupon which converts to a 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) The concentration of investments by type of obligation/market sector is as follows:

Insured	14.0%
General Obligation	6.0
Revenue Bonds:	
Health Revenue	27.2
Airport Revenue	15.3
Tobacco Revenue	10.4
Education Revenue	4.8
Pollution Control Revenue	4.4
Development Revenue	4.2

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Transportation Revenue	2.8
Power Revenue	2.7
Facilities Revenue	2.6
Other Revenue	2.6
Gaming Revenue	1.2
Housing Revenue	1.0
School District Revenue	0.6
Utilities Revenue	0.2
	100.0%

- (e) At January 31, 2007, the net unrealized gain on investments based on cost for federal income tax purposes of \$395,937,388 was as follows:

Aggregate gross unrealized gain for all investments
in which there is an excess of value over tax \$ 54,235,492

Aggregate gross unrealized loss for all investments
in which there is an excess of tax cost over v (349,286)
Net unrealized gain \$ 53,886,206

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.

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 March 30, 2007

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 March 30, 2007

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

Date March 30, 2007

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