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PIONEER MUNICIPAL HIGH INCOME TRUST
Form N-Q
September 28, 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: July 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 7/31/07 (unaudited)

Principal Amount (\$)		Value (\$)
	TAX EXEMPT OBLIGATIONS - 121.4%	
	Alabama - 1.3%	
1,500,000	Camden Alabama Industrial Development Board, 6.125%,	1,612,995
1,000,000	Huntsville-Redstone Village Special Care Facilities	971,300
2,000,000	Huntsville-Redstone Village Special Care Facilities	1,904,620
		4,488,915
	Arizona - 5.6%	
5,000,000	Apache County Industrial Development Authority, 5.85	5,002,000
5,000,000	Apache County Industrial Development Authority, 5.87	5,002,100
7,000,000 (a)	Downtown Phoenix Hotel Corp., RIB, 6.176%, 7/1/40 (1	7,553,560
1,000,000	Pima County Industrial Development Authority, 7.25%,	1,085,170
500,000	Yavapai County Industrial Development Authority, 6.0	529,095
		19,171,925
	California - 10.7%	
7,270,000	California State General Obligation, 5.25%, 2/1/28	7,620,123
5,000,000	California Statewide Communities Development Authori	5,014,300
5,150,000 +	Golden State Tobacco Securitization Corp., 7.8%, 6/1	6,178,970
7,000,000 +	Golden State Tobacco Securitization Corp., 7.875%, 6	8,423,310
2,000,000	San Diego Unified School District, 5.0%, 7/1/25	2,064,500
2,500,000	University of California Revenue, 5.0%, 5/15/25	2,583,450
5,000,000	Valley Health System Hospital Revenue, 6.5%, 5/15/25	5,013,800
		36,898,453
	Connecticut - 1.5%	
5,000,000	Mohegan Tribe Indians Gaming Authority, 6.25%, 1/1/3	5,251,300
	Delaware - 0.4%	
765,000	Sussex County Delaware Revenue, 5.9%, 1/1/26	771,311
600,000	Sussex County Delaware Revenue, 6.0%, 1/1/35	607,866
		1,379,177
	District of Columbia - 3.5%	
5,000,000	District of Columbia Tobacco Settlement Financing Co	5,773,300
6,000,000	District of Columbia Tobacco Settlement Financing Co	6,411,780
		12,185,080
	Florida - 3.0%	
2,000,000	Beacon Lakes Community Development, 6.9%, 5/1/35	2,150,840
1,000,000	St. Johns County Industrial Development Authority Re	986,260
2,000,000	St. Johns County Industrial Development Authority Re	1,985,620
5,000,000	Tallahassee Health Facilities Revenue, 6.375%, 12/1/	5,219,150
		10,341,870
	Guam - 1.4%	
5,000,000	Northern Mariana Islands, 5.0%, 10/1/22	4,947,300
	Georgia - 2.7%	
4,240,000 (a)	Atlanta Georgia Water & Waste Revenue, RIB, 6.271%,	4,604,470
2,400,000	Fulton County Residential Care Facilities Revenue, 5	2,311,968
2,600,000	Fulton County Residential Care Facilities Revenue, 5	2,499,900
		9,416,338
	Idaho - 1.5%	
5,000,000	Power County Industrial Development Corp., 6.45%, 8/	5,249,950
	Illinois - 5.7%	
1,000,000	Centerpoint Intermodal Center, 8.0%, 6/15/23 (144A)	1,007,640

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2,000,000	Chicago Illinois O'Hare International Airport Revenue	2,056,640
1,000,000	Illinois Finance Authority Revenue, 6.0%, 11/15/27	1,037,360
1,000,000	Illinois Finance Authority Revenue, 6.0%, 11/15/39	1,032,220
1,500,000	Illinois Health Facilities Authority Revenue, 6.9%,	1,635,900
16,880,00	(b)Metropolitan Pier & Exposition Authority Dedicated S	11,132,866
1,800,000	Southwestern Illinois Development Authority Revenue,	1,801,116
		19,703,742
	Indiana - 1.6%	
1,000,000	Indiana State Development Finance Authority Revenue,	1,020,370
4,300,000	Indiana State Development Finance Authority Revenue,	4,405,006
		5,425,376
	Massachusetts - 10.5%	
4,000,000	Massachusetts Bay Transportation Authority, 5.0%, 7/	4,315,520
1,335,000	Massachusetts Health & Educational Facilities Author	1,369,123
7,050,000	Massachusetts Health & Educational Facilities Author	7,319,733
3,500,000	Massachusetts Health & Educational Facilities Author	3,741,115
5,000,000	Massachusetts Health & Educational Facilities Author	5,363,100
9,810,000	(a)Massachusetts State Development Finance Agency, RIB,	10,755,684
3,055,000	Massachusetts State Housing Finance Agency, 5.25%, 1	3,086,864
		35,951,139
	Michigan - 2.5%	
950,000	Doctor Charles Drew Academy, 5.7%, 11/1/36	958,075
1,500,000	John Tolfree Health System Corp., 6.0%, 9/15/23	1,521,570
2,000,000	Michigan State Hospital Finance Authority Revenue, 5	1,950,060
4,010,000	Michigan State Hospital Finance Authority Revenue, 6	4,011,083
7,720,000	Wayne Charter County Special Airport Facilities Reve	0
		8,440,788
	Minnesota - 0.5%	
1,675,000	Duluth Economic Development Authority Health Care Fa	1,827,978
	Mississippi - 0.9%	
3,000,000	Mississippi Business Finance Corp. Pollution Control	3,028,980
	Montana - 0.5%	
1,600,000	Two Rivers Authority, Inc. Correctional Facility Imp	1,633,072
	Nevada - 2.2%	
1,000,000	Clark County Industrial Development Revenue, 5.45%,	1,030,470
4,600,000	Clark County Industrial Development Revenue, 5.5%, 1	4,472,304
2,000,000	Nevada State Department of Business & Industry, 7.25	2,029,960
		7,532,734
	New Hampshire - 0.9%	
3,000,000	Manchester School Facilities Revenue, 5.125%, 6/1/28	3,121,620
	New Jersey - 10.1%	
2,000,000	New Jersey Economic Development Authority Revenue, 6	2,057,240
13,350,000	New Jersey Economic Development Authority Revenue, 6	13,732,077
1,000,000	New Jersey Economic Development Authority Revenue, 6	1,026,690
6,150,000	New Jersey Economic Development Authority Revenue, 7	6,493,293
10,000,00	+ Tobacco Settlement Financing Corp., 6.75%, 6/1/39	11,457,800
		34,767,100
	New Mexico - 0.4%	
1,350,000	+ Santa Fe Educational Facilities Revenue, 5.75%, 10/1	1,501,646
	New York - 10.8%	
2,000,000	New York City Industrial Development Agency, 5.375%,	2,048,680
12,990,000	New York City Industrial Development Agency, 6.9%, 8	13,014,551
5,000,000	New York City Trust Cultural Resources Revenue, 5.12	5,189,850
7,040,000	(a)New York State Dormitory Authority Revenue, RIB, 6.4	8,355,565
2,000,000	Suffolk County Industrial Development Agency, 7.25%,	2,086,400
6,000,000	Triborough Bridge & Tunnel Authority Revenue, 5.25%,	6,314,160

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		37,009,206
	North Carolina - 2.6%	
4,030,000	Charlotte North Carolina Special Facilities Revenue,	4,016,379
4,600,000	Charlotte North Carolina Special Facilities Revenue,	4,856,726
		8,873,105
	Oklahoma - 6.2%	
3,000,000 +	Oklahoma Development Finance Authority Revenue, 5.62	3,132,660
8,000,000 +	Oklahoma Development Finance Authority Revenue, 5.62	8,353,760
4,100,000	Tulsa Municipal Airport Revenue, 5.65%, 12/1/35	4,115,949
1,225,000	Tulsa Municipal Airport Revenue, 6.25%, 6/1/20	1,225,576
4,350,000	Tulsa Municipal Airport Revenue, 7.35%, 12/1/11	4,357,178
		21,185,123
	Pennsylvania - 6.6%	
3,000,000	Allegheny County Hospital Development Authority Reve	2,812,950
1,550,000	Allegheny County Hospital Development Authority Reve	1,549,938
12,300,00 +	Allegheny County Hospital Development Authority Reve	14,530,236
1,000,000	Columbia County Hospital Authority Health Care Reven	898,480
1,000,000	Hazleton Health Services Authority Hospital Revenue,	986,890
1,280,000	Langhorne Manor Borough Higher Education & Health Au	1,298,304
500,000	Pennsylvania Higher Educational Facilities Authority	513,545
		22,590,343
	Rhode Island - 1.3%	
4,000,000	Central Falls Detention Facilities Revenue, 7.25%, 7	4,429,240
	South Carolina - 1.9%	
5,185,000 +	South Carolina Jobs Economic Development Authority R	5,844,999
665,000 +	South Carolina Jobs Economic Development Authority R	747,945
		6,592,944
	Tennessee - 3.7%	
7,000,000	Johnson City Health & Educational Facilities Board H	7,981,610
4,480,000	Knox County Health Educational & Housing Facilities	4,553,158
		12,534,768
	Texas - 10.7%	
1,345,000	Bexar County Housing Finance Corp., 8.0%, 12/1/36	1,416,164
1,000,000	Dallas-Fort Worth International Airport Revenue, 6.0	1,000,440
5,000,000	Dallas-Fort Worth International Airport Revenue, 6.1	5,004,050
4,000,000	Decatur Hospital Authority Revenue, 7.0%, 9/1/25	4,318,640
1,000,000 +	Georgetown Health Facilities Development Corp., 6.25	1,065,620
2,000,000	Gulf Coast Industrial Development Authority Revenue,	2,106,080
3,750,000	Houston Airport System Special Facilities Revenue, 5	3,778,200
5,340,000	Lubbock Health Facilities Development Corp., 6.625%,	5,556,857
2,450,000 (a)	Northside Independent School District, RIB, 6.683%,	2,721,019
500,000	Sabine River Authority Pollution Control Revenue, 6.	526,080
7,040,000 (a)	Texas State, RIB, 6.153%, 4/1/30 (144A)	7,762,234
1,365,000	Willacy County Local Government Corp. Revenue, 6.0%,	1,370,296
		36,625,680
	Utah - 0.2%	
800,000	Spanish Fork City Charter School Revenue, 5.55%, 11/	805,816
	Vermont - 0.5%	
1,500,000	Vermont Educational & Health Buildings Financing Age	1,634,205
	Virginia - 1.5%	
1,000,000	Peninsula Ports Authority, 6.0%, 4/1/33	1,045,070
4,000,000 +	Pocahontas Parkway Association of Virginia Toll Road	4,149,680
		5,194,750
	Washington - 7.3%	
4,710,000	Spokane Public Facilities District Hotel/Motel Tax &	5,101,118
7,025,000	Tobacco Settlement Authority Revenue, 6.625%, 6/1/32	7,548,081
14,315,000	Washington State General Obligation, 0.0%, 6/1/22	7,259,852
5,000,000	Washington State Housing Finance Committee Nonprofit	5,092,650

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		25,001,701
2,400,000	Wisconsin - 0.7% Aztalan Wisconsin Exempt Facilities Revenue, 7.5%, 5	2,375,592
	TOTAL TAX-EXEMPT OBLIGATIONS (Cost \$376,484,330)	417,116,956
10,000,000(c)	MUNICIPAL COLLATERALIZED DEBT OBLIGATION - 2.9% of Net Assets Non-Profit Preferred Funding Trust I, Series E, 12.5	9,899,800
	TOTAL MUNICIPAL COLLATERALIZED DEBT OBLIGATION (Cost \$10,000,000)	9,899,800
Shares	COMMON STOCK - 0.8% of Net Assets	
159,872	Northwest Airlines Corp. TOTAL COMMON STOCK (Cost \$6,612,756)	2,786,569 2,786,569
9,213,574	TAX-EXEMPT MONEY MARKET MUTUAL FUND - 2.7% of Net Assets BlackRock Liquidity Funds MuniFund Portfolio	9,213,574
	TOTAL TAX-EXEMPT MONEY MARKET MUTUAL FUND (Cost \$9,213,574)	9,213,574
	TOTAL INVESTMENTS IN SECURITIES - 127.8% (Cost \$402,310,660) (d) (e)	439,016,899
	OTHER ASSETS AND LIABILITIES - 1.6%	5,450,496
	PREFERRED SHARES AT REDEMPTION VALUE, INCLUDING DIVIDENDS PAYABLE - (29.4)%	(101,061,645)
	NET ASSETS APPLICABLE TO COMMON SHAREOWNERS - 100.0%	343,405,750
RIB	Residual Interest Bonds	
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, 2007 the value of these securities amounted to \$58,717,088 or 17.1% of net assets applicable to common shareowners.	
+	Prerefunded bonds have been collateralized by U.S. Treasury securities or U.S. Government Agencies 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 July 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 July 31, 2007.	
(c)	The interest rate is subject to change periodically. The interest rate shown is the rate at July 31, 2007.	
(d)	The concentration of investments by type of	

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obligation/market sector is as follows:

Insured	13.5
General Obligation	6.9
Revenue Bonds:	
Health Revenue	25.5
Airport Revenue	14.5
Tobacco Revenue	10.4
Education Revenue	4.8
Pollution Control Revenue	4.5
Development Revenue	4.3
Other Revenue	3.3
Power Revenue	2.7
Housing Revenue	2.6
Transportation Revenue	2.6
Facilities Revenue	2.4
Gaming Revenue	1.2
School District Revenue	0.6
Utilities Revenue	0.2
	100.0

- (e) At July 31, 2007, the net unrealized gain on investments based on cost for federal income tax purposes of \$400,670,193 was as follows:

Aggregate gross unrealized gain for all investments there is an excess of value over tax cost	44,237,635
Aggregate gross unrealized loss for all investments there is an excess of tax cost over value	(5,890,929)
Net unrealized gain	38,346,706

For financial reporting purposes net unrealized gain on investments was \$36,706,239 and cost of investments aggregated \$402,310,660.

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.

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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 September 28, 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 September 28, 2007

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

Date September 28, 2007

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