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PIONEER MUNICIPAL HIGH INCOME TRUST  
Form N-Q  
March 31, 2005

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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 811-09223

Pioneer Municipal High Income Trust Fund;  
(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: October 31

Date of reporting period: January 31, 2005

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 1/31/05 (unaudited)

Principal Amount	S&P/Moody's Ratings	
		TAX EXEMPT OBLIGATIONS - 126.4% of Net Assets
		Alabama - 3.5%
1000000	AAA/Aaa	Birmingham Alabama General Obligation, 5.0%, 12/1/32
1500000	BBB/NR	Camden Alabama Industrial Development Board, 6.125%, 12/1/24
		Arizona - 7.1%
5000000	B+/Ba3	Apache County Industrial Development Authority, 5.85%, 3/1/28
5000000	B+/Ba3	Apache County Industrial Development Authority, 5.875%, 3/1/33
11630000	BB-/Ca	Gila County Industrial Development Authority, 5.55%, 1/1/27
3000000	NR/NR	Maricopa County Industrial Development Authority, 7.875%, 4/1/27
1000000	NR/Baa3	Pima County Industrial Development Authority, 7.25%, 7/1/31
500000	NR/Baa2	Yavapai County Industrial Development Authority, 6.0%, 8/1/33
		California - 10.5%
7270000	A/A3	California State General Obligation, 5.25%, 2/1/28
5150000	BBB/Baa3	Golden State Tobacco Securitization Corp., 7.8%, 6/1/42
7000000	BBB/Baa3	Golden State Tobacco Securitization Corp., 7.875%, 6/1/42
4000000	AAA/Aaa	Palm Desert Financing Authority Tax Allocation Revenue, 5.0%, 4/1/30
3000000	AAA/Aaa	San Diego Unified School District, 5.0%, 7/1/25
2500000	AAA/Aaa	University of California Revenue, 5.0%, 5/15/25
5000000	B+/NR	Valley Health System Hospital Revenue, 6.5%, 5/15/25
		Connecticut - 3.3%
2205000	BB/Ba1	Connecticut State Health & Educational Facilities Authority Revenue, 5.375%,
4400000	BB/Ba1	Connecticut State Health & Educational Facilities Authority Revenue, 5.5%, 7/
5000000	BB+/NR	Mohegan Tribe Indians Gaming Authority, 6.25%, 1/1/31
		District of Columbia - 3.6%
5000000	BBB/Baa3	District of Columbia Tobacco Settlement Financing Corp., 6.5%, 5/15/33
7325000	BBB/Baa3	District of Columbia Tobacco Settlement Financing Corp., 6.75%, 5/15/40
		Florida - 4.3%
2000000	NR/NR	Beacon Lakes Community Development, 6.9%, 5/1/35
2300000	CC/C	Hillsborough County Aviation Authority Revenue, 6.8%, 1/1/24
1650000	BBB-/Baa2	Polk County Industrial Development Revenue, 5.85%, 12/1/30
2000000	NR/NR	Seminole Tribe Convention-A, 8.95%, 10/1/33
1900000	NR/NR	Seminole Tribe Convention-A, 10.0%, 10/1/33
5000000	NR/Baa2	Tallahassee Health Facilities Revenue, 6.375%, 12/1/30
		Georgia - 0.4%
1325000	NR/NR	Brunswick & Glynn County Development Authority Revenue, 7.25%, 1/1/35
		Idaho - 1.5%
5000000	BB+/Ba3	Power County Industrial Development Corp., 6.45%, 8/1/32
		Illinois - 4.2%
1000000	NR/NR	Centerpoint Intermodal Center, 8.0%, 6/15/23 (144A)
3810000	CC/C	Chicago Illinois O'Hare International Airport, 6.45%, 5/1/18
1500000	NR/NR	Illinois Health Facilities Authority Revenue, 6.9%, 11/15/33

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16880000	(a)AAA/Aaa	Metropolitan Pier & Exposition Authority Dedicated State Tax Revenue, 0.0%, 6/15/22
		Indiana - 1.6%
1000000	BBB+/Baa1	Indiana State Development Finance Authority Revenue, 5.6%, 12/1/32
4300000	BB+/Caa2	Indiana State Development Finance Authority Revenue, 5.75%, 10/1/11
Principal Amount	S&P/Moody's Ratings	
		Kentucky - 2.3%
7050000	CC/Ca	Kenton County Airport Revenue, 7.5%, 2/1/12
1965000	CC/Ca	Kenton County Airport Revenue, 7.5%, 2/1/20
		Massachusetts - 9.2%
2435000	AAA/Aaa	Massachusetts Health & Educational Facilities Authority Revenue, 5.0%, 7/15/3
7050000	AAA/Aaa	Massachusetts Health & Educational Facilities Authority Revenue, 5.125%, 7/15
1000000	AA/NR	Massachusetts Health & Educational Facilities Authority Revenue, 5.25%, 10/15
3500000	BBB/Baa3	Massachusetts Health & Educational Facilities Authority Revenue, 6.25%, 7/1/2
5000000	BBB-/NR	Massachusetts Health & Educational Facilities Authority Revenue, 6.75%, 10/1/
75000	BB/NR	Massachusetts State Development Finance Agency, 5.25%, 10/1/18
5000000	AAA/Aaa	Massachusetts State Development Finance Agency, 5.75%, 1/1/42
5055000	AA-/Aa3	Massachusetts State Housing Finance Agency, 5.25%, 12/1/33
		Michigan - 4.6%
1500000	BBB-/NR	John Tolfree Health System Corp., 6.0%, 9/15/23
2000000	B/Ba3	Michigan State Hospital Finance Authority Revenue, 5.5%, 8/15/23
4010000	BBB-/Ba1	Michigan State Hospital Finance Authority Revenue, 6.0%, 2/1/24
2000000	NR/NR	Michigan State Hospital Finance Authority Revenue, 6.4%, 1/1/15
7690000	NR/NR	Wayne Charter County Michigan Special Airport Facilities Revenue, 6.75%, 12/1
		Minnesota - 4.5%
1675000	BB/NR	Duluth Economic Development Authority Health Care Facilities Revenue, 7.25%,
13260000	NR/NR	Minneapolis/St. Paul Metropolitan Airports, 7.0%, 4/1/25
1430000	BB+/Ba1	St. Paul Housing & Redevelopment Authority, 6.625%, 11/1/17
		Mississippi - 0.9%
3000000	BBB/Ba1	Mississippi Business Finance Corp. Pollution Control Revenue, 5.9%, 5/1/22
		Missouri - 1.4%
5500000	NR/B3	St. Louis Industrial Development Authority Revenue, 7.25%, 12/15/35
		Nevada - 1.4%
1000000	BBB-/Baa2	Clark County Industrial Development Revenue, 5.45%, 3/1/38
1850000	B-/NR	Clark County Industrial Development Revenue, 5.5%, 10/1/30
2000000	NR/NR	Nevada State Department of Business & Industry, 7.25%, 1/1/23
		New Hampshire - 0.9%
3000000	AAA/Aaa	Manchester School Facilities Revenue, 5.125%, 6/1/28
		New Jersey - 8.2%
2000000	B/Caa2	New Jersey Economic Development Authority Revenue, 6.25%, 9/15/19
11700000	B/Caa2	New Jersey Economic Development Authority Revenue, 6.25%, 9/15/29
1000000	B/Caa2	New Jersey Economic Development Authority Revenue, 6.4%, 9/15/23
6150000	B/Caa2	New Jersey Economic Development Authority Revenue, 7.0%, 11/15/30
10750000	BBB/Baa3	Tobacco Settlement Financing Corp., 6.75%, 6/1/39
		New Mexico - 1.6%
3700000	+ NR/NR	New Mexico Hospital Equipment Loan Council, 6.4%, 6/1/16
1350000	BBB-/NR	Santa Fe Educational Facilities Revenue, 5.75%, 10/1/28
		New York - 5.8%
2000000	A/NR	New York City Industrial Development Agency, 5.375%, 6/1/23

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5625000	CCC/Caa2	New York City Industrial Development Agency, 6.9%, 8/1/24
5000000	AAA/Aaa	New York City Trust Cultural Resources Revenue, 5.125%, 7/1/31
2000000	NR/NR	Suffolk County Industrial Development Agency, 7.25%, 1/1/30
6000000	AAA/Aaa	Triborough Bridge & Tunnel Authority Revenue, 5.25%, 11/15/30
North Carolina - 0.6%		
4600000	(b)NR/NR	Charlotte North Carolina Special Facilities Revenue, 7.75%, 2/1/28
Principal Amount	S&P/Moody's Ratings	
Oklahoma - 5.0%		
3000000	++AAA/Aaa	Oklahoma Development Finance Authority Revenue, 5.625%, 8/15/19
8000000	++AAA/Aaa	Oklahoma Development Finance Authority Revenue, 5.625%, 8/15/29
4100000	B-/Caa2	Tulsa Municipal Airport Revenue, 5.65%, 12/1/35
1225000	B-/Caa2	Tulsa Municipal Airport Revenue, 6.25%, 6/1/20
Oregon - 4.6%		
1000000	NR/NR	Klamath Falls Electric Revenue, 5.75%, 1/1/13
7000000	NR/NR	Klamath Falls Electric Revenue, 6.0%, 1/1/25
7500000	NR/NR	Western Generation Agency Cogeneration Project Revenue, 7.125%, 1/1/21
Pennsylvania - 7.1%		
1550000	NR/Baa1	Allegheny County Hospital Development Authority Revenue, 5.125%, 5/1/25
12300000	B/B1	Allegheny County Hospital Development Authority Revenue, 9.25%, 11/15/30
1000000	BB-/NR	Columbia County Hospital Authority Health Care Revenue, 5.9%, 6/1/29
1000000	BBB/Baa2	Hazleton Health Services Authority Hospital Revenue, 5.625%, 7/1/17
1280000	NR/B2	Langhorne Manor Borough Higher Education & Health Authority Revenue, 7.35%, 7/1/21
500000	BBB+/NR	Pennsylvania Higher Educational Facilities Authority Revenue, 5.4%, 7/15/36
5000000	BBB-/Baa3	Philadelphia Hospitals & Higher Education Facilities Authority Revenue, 6.5%, 7/1/21
South Carolina - 8.0%		
4250000	BBB/Baa2	Georgetown County Environmental Improvement Revenue, 5.95%, 3/15/14
15000000	AA-/A1	Greenville County School District, 5.5%, 12/1/28
5850000	BBB/Baa2	South Carolina Jobs Economic Development Authority Revenue, 6.375%, 8/1/34
Tennessee - 3.8%		
7000000	BBB+/Baa2	Johnson City Health & Educational Facilities Board Hospital Revenue, 7.5%, 6/1/21
4480000	NR/Baa3	Knox County Health Educational & Housing Facilities Board Hospital Revenue, 6.375%, 8/1/21
Texas - 7.6%		
7500000	CCC/Caa2	Alliance Airport Authority Special Facilities Revenue, 7.5%, 12/1/29
1345000	NR/Baa3	Bexar County Housing Finance Corp., 8.0%, 12/1/36
2500000	BBB-/Ba2	Brazos River Authority Revenue, 5.375%, 4/01/19
5000000	CCC/Caa2	Dallas-Fort Worth International Airport Revenue, 6.15%, 5/1/29
485000	CC/Ca	Dallas-Fort Worth International Airport Revenue, 6.25%, 11/1/13
7750000	CC/Ca	Dallas-Fort Worth International Airport Revenue, 7.125%, 11/1/26
4000000	NR/NR	Decatur Hospital Authority Revenue, 7.0%, 9/1/25
1000000	BB/NR	Georgetown Health Facilities Development Corp., 6.25%, 8/15/29
3750000	B-/Caa2	Houston Airport System Special Facilities Revenue, 5.7%, 7/15/29
500000	BBB/Baa2	Sabine River Authority Pollution Control Revenue, 6.15%, 8/1/22
Vermont - 0.5%		
1500000	A-/A3	Vermont Educational & Health Buildings Financing Agency Revenue, 6.0%, 10/1/21
Virginia - 1.4%		
1000000	BBB/Baa3	Peninsula Ports Authority, 6.0%, 4/1/33
4000000	BB/NR	Pocahontas Parkway Association of Virginia Toll Road Revenue, 5.5%, 8/15/28
Washington - 5.5%		
4710000	AAA/Aaa	Spokane Public Facilities District Hotel/Motel Tax & Sales, 5.75%, 12/1/27
7025000	BBB/Baa3	Tobacco Settlement Authority Washington, 6.625%, 6/1/32
14315000	AAA/Aaa	Washington State General Obligation, 0.0%, 6/1/22

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Principal Amount	S&P/Moody's Ratings	
5000000	BB+/Ba3	Wyoming - 1.5% Sweetwater County Solid Waste Disposal Revenue, 6.9%, 9/1/24

TOTAL TAX-EXEMPT OBLIGATIONS  
(Cost \$405,193,884)

Shares		TAX-EXEMPT MONEY MARKET MUTUAL FUND - 0.3% of Net Assets
1112083		BlackRock Provident Institutional Municipal Fund
		TOTAL TAX-EXEMPT MONEY MARKET MUTUAL FUND
		(Cost \$1,112,083)

TOTAL INVESTMENTS IN SECURITIES - 126.7%  
(Cost \$406,305,967) (c) (d)  
OTHER ASSETS AND LIABILITIES - 2.7%  
PREFERRED SHARES AT REDEMPTION VALUE - (29.4)%  
NET ASSETS APPLICABLE TO COMMON SHAREOWNERS - 100.0%

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. Securities may be resold normally to qualified institutional buyers in a transaction that is exempt from registration. At January 31, 2005 the value of these securities amounted to \$977,600 or 0.3% of net assets applicable to common shareholders.

+ Prerefunded bonds have been collateralized by cash sufficient to pay interest and principal on the tax exempt issue and to retire the bonds in full at the earliest refunding date.

++ 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) Indicates a security that has a zero coupon that remains in effect until a predetermined date at which time the stated coupon rate becomes effective until final maturity.

(b) Security is in default and is non-incoming producing.

(c) The concentration of investments by type of obligation/market sector is as follows:  
Insured  
General Obligation  
Revenue Bonds:

- Health Revenue
- Airport Revenue
- Tobacco Revenue
- Education Revenue
- Pollution Control Revenue
- Development Revenue
- Power Revenue
- Transportation Revenue
- Housing Revenue
- Other
- Gaming Revenue
- Facilities Revenue
- Utilities Revenue

(d) (b) At January 31, 2005, the net unrealized gain on investments based on cost for federal income tax purposes of \$405,495,705 was as follows:

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- (e) Aggregate gross unrealized gain for all investments in which there is an excess of value over tax cost
- (f) Aggregate gross unrealized loss for all investments in which there is an excess of tax cost over value  
Net unrealized gain

For financial reporting purposes net unrealized gain on investments was \$28,792,139 and cost of investments aggregated \$406,305,967

The interest rate swaps outstanding as of January 31, 2005 were as follows:

Termination Counterparty	Notional Date	Fixed Amount (000)	Rate	Unrealized
UBS AG	April 5, 2009	\$50,000	2.665% 1 month BMA	\$552,500

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 certifying officers have determined that the registrant's disclosure controls and procedures are effective based on an evaluation of these controls and procedures as of a date within 90 days prior to 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 was no significant change in the registrant's internal controls over financial reporting 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.

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

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[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 Fund;

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

Date March 30, 2005

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, 2005

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

Date March 30, 2005

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