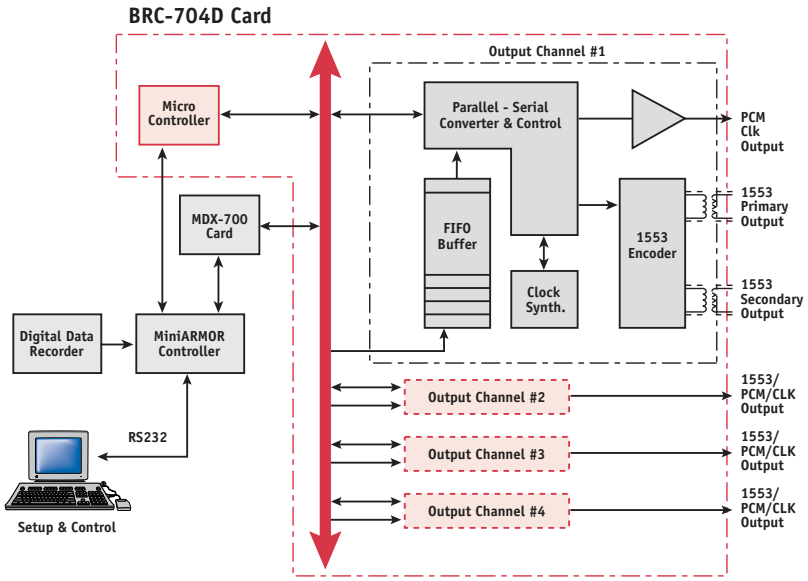
Technical Bulletin

MiniARMOR Signal Interface Card

BRC-704D 4-Channel 1553/Serial PCM Reconstruction

Airborne Data Acquisition Products



FEATURES

- Reconstructs four independent asynchronous 1553 or PCM output channels per card (data & clock)
- All 1553 messages are reconstructed on the primary/secondary bus including response and message gaps
- PCM, per-channel reconstruction rates up to 10 Mbps for NRZ outputs
- Per channel FIFO buffering with status output reporting
- Windows®* Programming software

APPLICATIONS

- Aircraft Flight Test
- Aircraft Static Test
- Aircraft Fatigue Test
- Ground Vehicle Test
- Wind Tunnel Test

L3 communications

GENERAL DESCRIPTION

The BRC-704D is a 1553 or PCM Output Reconstructor card which works in conjunction with BRC-704M 1553/ Serial PCM Acquisition Card (or the PCM-704M PCM Acquisition Card).** Using the BRC-704D, up to 4 independent, asynchronous 1553 or Serial PCM data streams can be reconstructed into their original formats and data rates during tape playback or during the recording process for real-time monitoring purposes. The card accepts parallel data on a frame basis from the MiniARMOR-700 Demultiplexer card (MDX-700). This data is buffered, serialized, and encoded out by the channels synthesized clock.

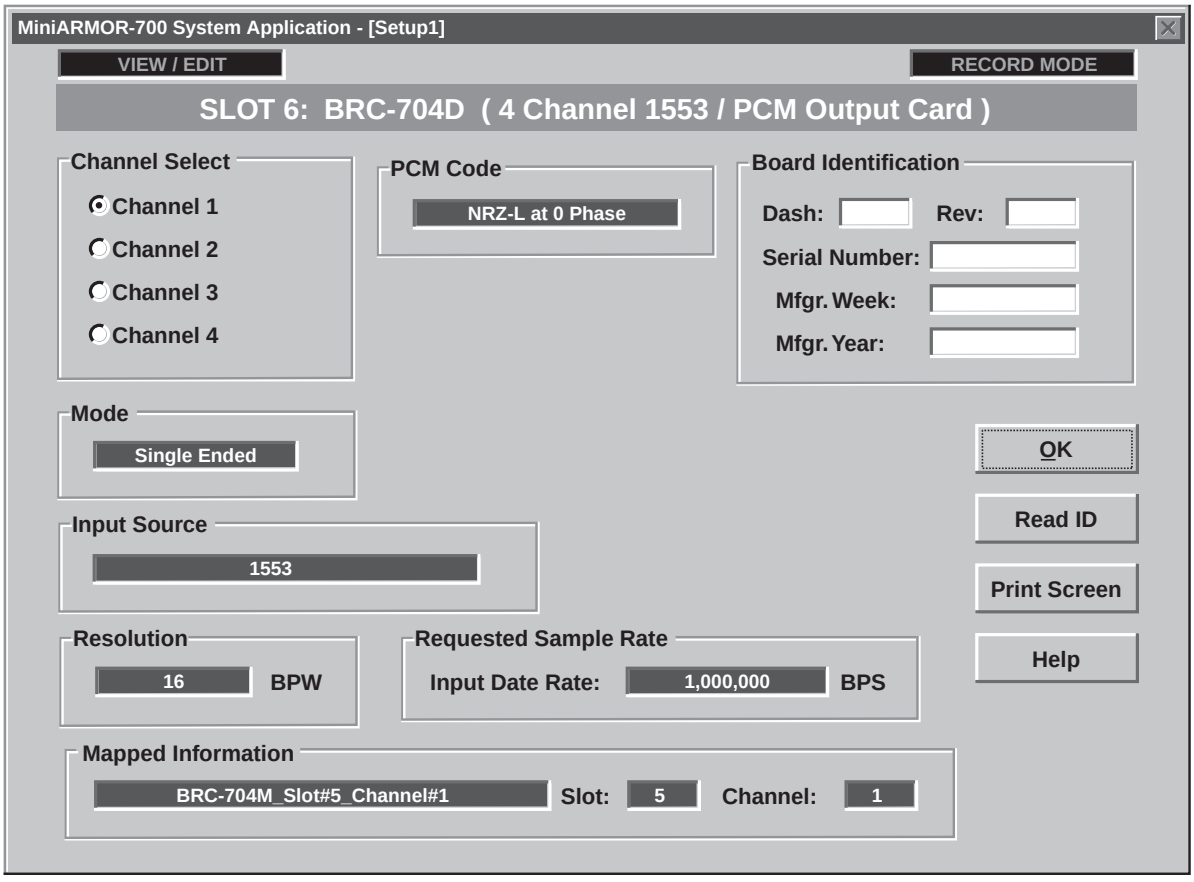
The output clock rate is automatically set to match the original bit rate at the time of recording. In the case of PCM, the serialized data is output along with the synthesized clock using an NRZ-L differential RS-422 format. In the case of 1553, the output rate is fixed at 1 MHz. All 1553 gaps are reconstructed to within ±0.5 µsec.

PROGRAMMABLE FEATURES MENU

BRC-704D playback rate is based on the original recording data rate, and on the MiniARMOR playback frame rate. MiniARMOR software can be used to simultaneously vary the playback rate for all data outputs within the MiniARMOR chassis.

When 1553 data is played back at a rate other than the recorded rate, the 1553 will not be reconstructed at 1 MHz.

** When PCM Acquisition was done at less than 10 Mbps for NRZ and 5 Mbps for Bi-phase.



CIRCUIT DESCRIPTION

The BRC-704D reconstructs up to 4 independent channels of 1553 or PCM data. Each channel is configurable to 1553 or PCM independent of the other channels. Each channel is reconstructed at a software selected data rate which is specified by the user during initial system setup. These rates are automatically used during playback operations assuring that the original data is faithfully reconstructed.

PCM OUTPUT CODES

The BRC-704D produces the same output code as originally recorded, i.e., an NRZ or RNRZ input results in an NRZ or RNRZ, output respectively. However, when a Bi-phase signal is recorded, the output code provided during playback is NRZ-L.

Input bit rate is programmable by the user on a per-channel basis during setup configuration. For NRZ-L or RNRZ-L inputs, the recording/playback rate can range from 100 bps to 10 Mbps. For Bi-phase-L inputs, the recording/playback rate can range from 100 bps to 5 Mbps.

CONFIGURATIONS

BRC-704D cards can be placed within a single MiniARMOR-700 chassis in any combination depending on the number of available card slots. The number of BRC-704M and BRC-704D cards does not necessarily have to be the same. For example, a particular chassis could contain 4 BRC-704M cards and 2 BRC-704D cards.

DATA RECONSTRUCTION

The MiniARMOR software automatically creates a “MiniARMOR Format” based on the settings defined for each input channel and the type of recorder used. Data acquired from each channel of the BRC-704M card is placed along with other data in a frame consisting of a number of sequential 16-bit words. The number of 16-bit words is determined by the software as established by an optimal data packing/minimum overhead algorithm. In addition, the number of 16-bit words per frame will vary slightly depending on the sample rates of the input channels and the MiniARMOR frame rate. This feature allows all MiniARMOR channels to operate in an asynchronous manner.

During playback, the channel data is extracted from each MiniARMOR frame and buffered for subsequent transmission in the BRC-704D card. Since the number of words per MiniARMOR frame varies, the playback rate must be continuously adjusted to provide a smooth, continuous 1553 or PCM output stream on each channel. This is achieved through the use of a digital clock synthesizer, and a 1553 encoder.

MICROCONTROLLER FUNCTION

The BRC-704D card uses a 68HC11 based microcontroller core. The primary function of this circuit is to initialize on-card hardware after input power application. The setup configuration is extracted from non-volatile EEPROM devices.

PCM SPECIFICATIONS

Output Signals:	PCM data and accompanying zero-degree clock
Output Bit Rate:	100 bps to 10 Mbps (NRZ/RNRZ); 100 bps to 5 Mbps (Biphase-L)
Output Coding:	NRZ, RNRZ input result in NRZ, RNRZ outputs respectively; Biphase-L inputs result in NRZ outputs.
Output Configuration:	Differential (RS422)

1553 SPECIFICATIONS

Output:	One (1) dual-redundant MIL-STD 1553B Bus
Coupling:	Transformer Coupling
Transmission Bit Rate:	1 Mbps ± 0.1%

GENERAL SPECIFICATIONS

Capacity:	4 channels per card; software configurable for either PCM or 1553 acquisition on a per channel basis.
Compatibility:	Occupies one (1) MiniARMOR Slot
Power:	11W maximum
Connector:	DCM37SD
Mating Connector:	DCMAM-37P

BRC-704D SIGNAL CONNECTOR

	Chan1 Data+	1	20	Chan1 Data-
	Chan1 A1553+	2	21	Chan1 A1553-
	Chan1 Clock+	3	22	Chan1 Clock-
	Chan2 A1553+	4	23	Chan2 A1553-
	Chan2 Data+	5	24	Chan2 Data-
	Chan3 A1553+	6	25	Chan3 A1553-
	Chan2 Clock+	7	26	Chan2 Clock-
	Chan4 A1553+	8	27	Chan4 A1553-
	Chan1 B1553+	9	28	Chan1 B1553-
	Chan2 B1553+	10	29	Chan2 B1553-
	Chan3 B1553+	11	30	Chan3 B1553-
	Chan4 B1553+	12	31	Chan4 Clock-
	Chan4 Clock+	13	32	Chan4 B1553-
	DGnd	14	33	Chan4 Data-
	Chan4 Data+	15	34	Chassis
	Chassis	16	35	Chan3 Clock-
	Chan3 Clock+	17	36	DGnd
	DGnd	18	37	Chan3 Data-
	Chan3 Data+	19		

ORDERING INFORMATION

Basic Module **Part No.**

4-Channel 1553/Serial PCM Output Card....BRC-704D

Related Functional Modules

4-Channel 1553/Serial PCM Input Card . . BRC-704M
4-Channel PCM Input Card PCM-704M
4-Channel PCM Output Card PCM-704D

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L3 communications

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