

An Automated Data Acquisition System

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THIC Meeting at SEATAC Airport Center

Seattle, Washington

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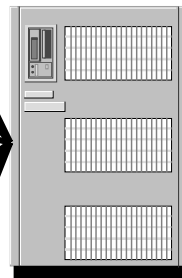
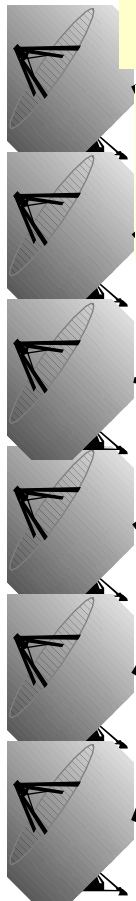
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Overview

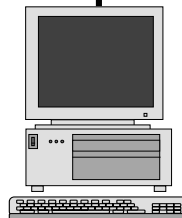
Sony DIR-1000/ DMS-700
736 M cassettes/ robotics
3 Recorders/ robotics

6 Streams of Signal

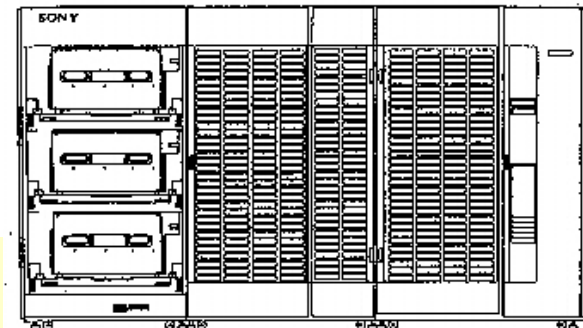
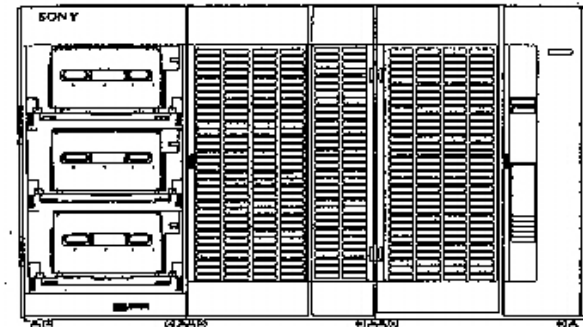
Each stream
3 channel low level analog signal
3 MHz of Bandwidth



Signal monitor
Analysis



Fs :8 MHz /10 bit
32 MBps/ Stream
20 min./ cassette
72 cassettes/ day

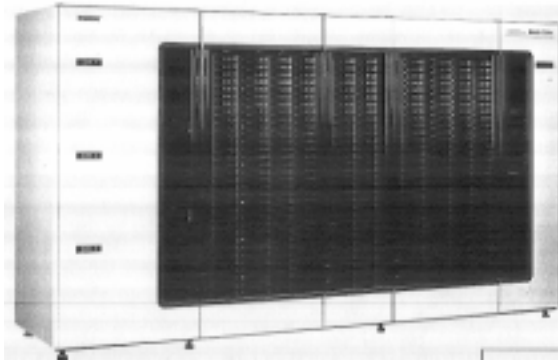


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Sony DIR-1000/ DMS-700M



- DIR-1000
 - ID-1 format
 - 32 MB/s of Recording Speed
 - 43 GB of Capacity / Medium Cassette



- DMS-700M
 - 736 Medium Cassettes
 - 30 TB

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Requirement

- **There are 6 streams to be recorded. Each stream has 3 channels of wide band(3 MHz) signal.**
- **Record one (or partially two) of 6 streams**
 - **24 hours/ day, 7 days/ week, 30 days / month**
- **Recorded Data can be reproduced during recording**
 - **Monitor**
 - **Copy**
- **Recorded Data shall be kept 2 weeks after recorded**
 - **Important data(less than 5 %) will be kept longer**
 - **Another Data will be over written**
- **Tapes will be used repeatedly**

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Objectives

- Automated Data Acquisition System
 - Lightout operation
 - Seamless recording of more than 30 days
- Signal to Noise Ratio of better than 60 dB
- To allow playback during recording the data

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Automated System

- **Necessity for an Automated System**
 - All equipment must be controlled
 - Host can get status of all equipment
 - Flexibility of recorder selection is key for continuous recording
 - Flexibility of stream selection is key for scheduled recording
- **For Precise Timing Control**
 - Use SYNC signal(same as ID-1)

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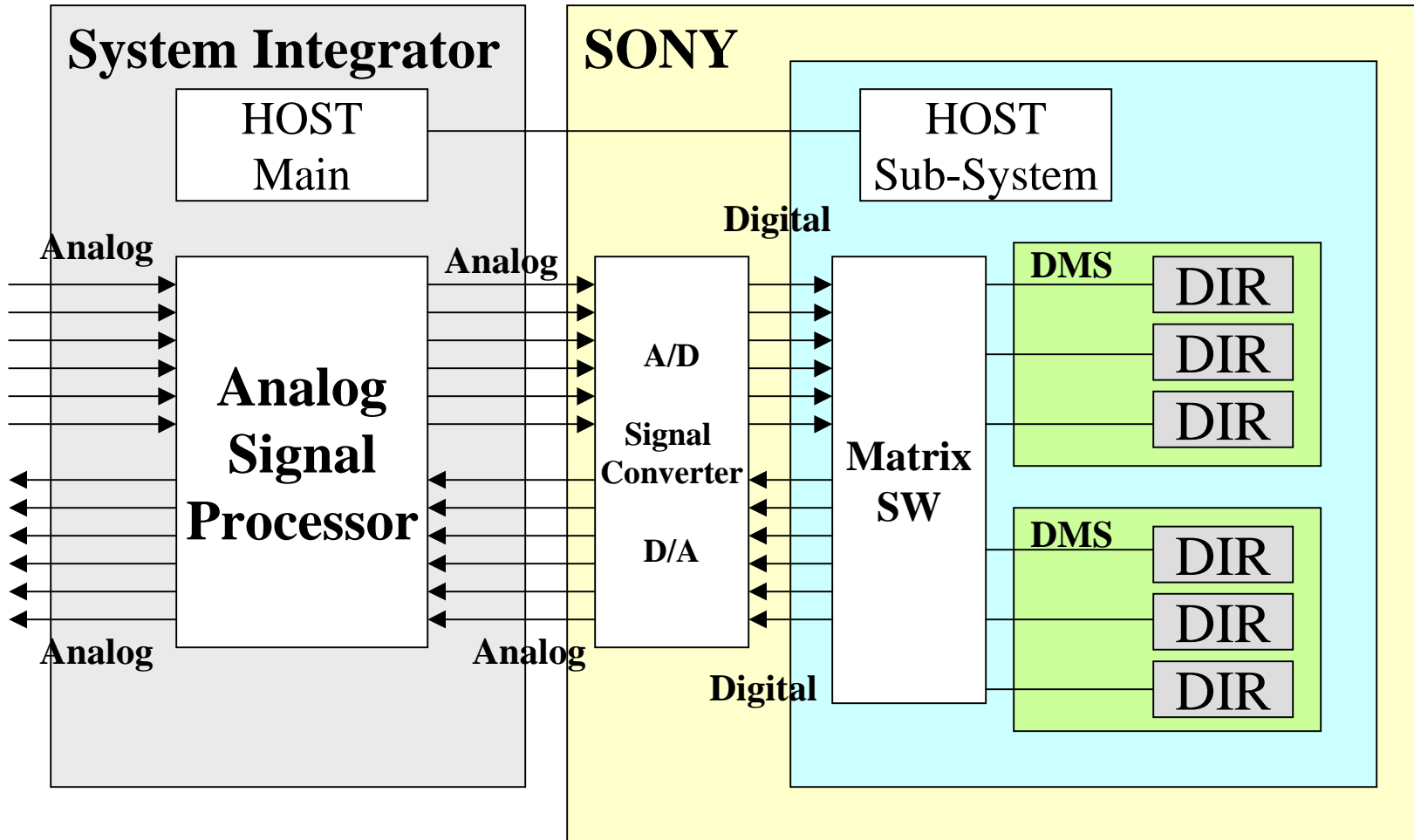
Automated System

Reproduce

- **To Reproduce Any Data**
 - Precise Timing Control
 - Host must know the location of the data
 - Reproduced any data with any length
 - Must be seamless to keep information

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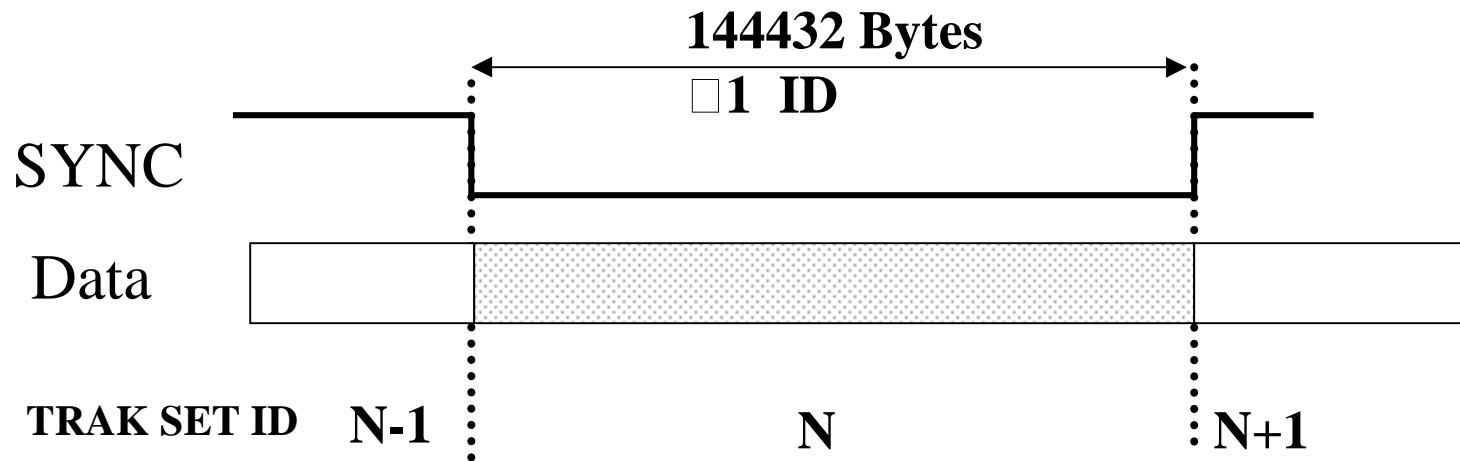
System Overview



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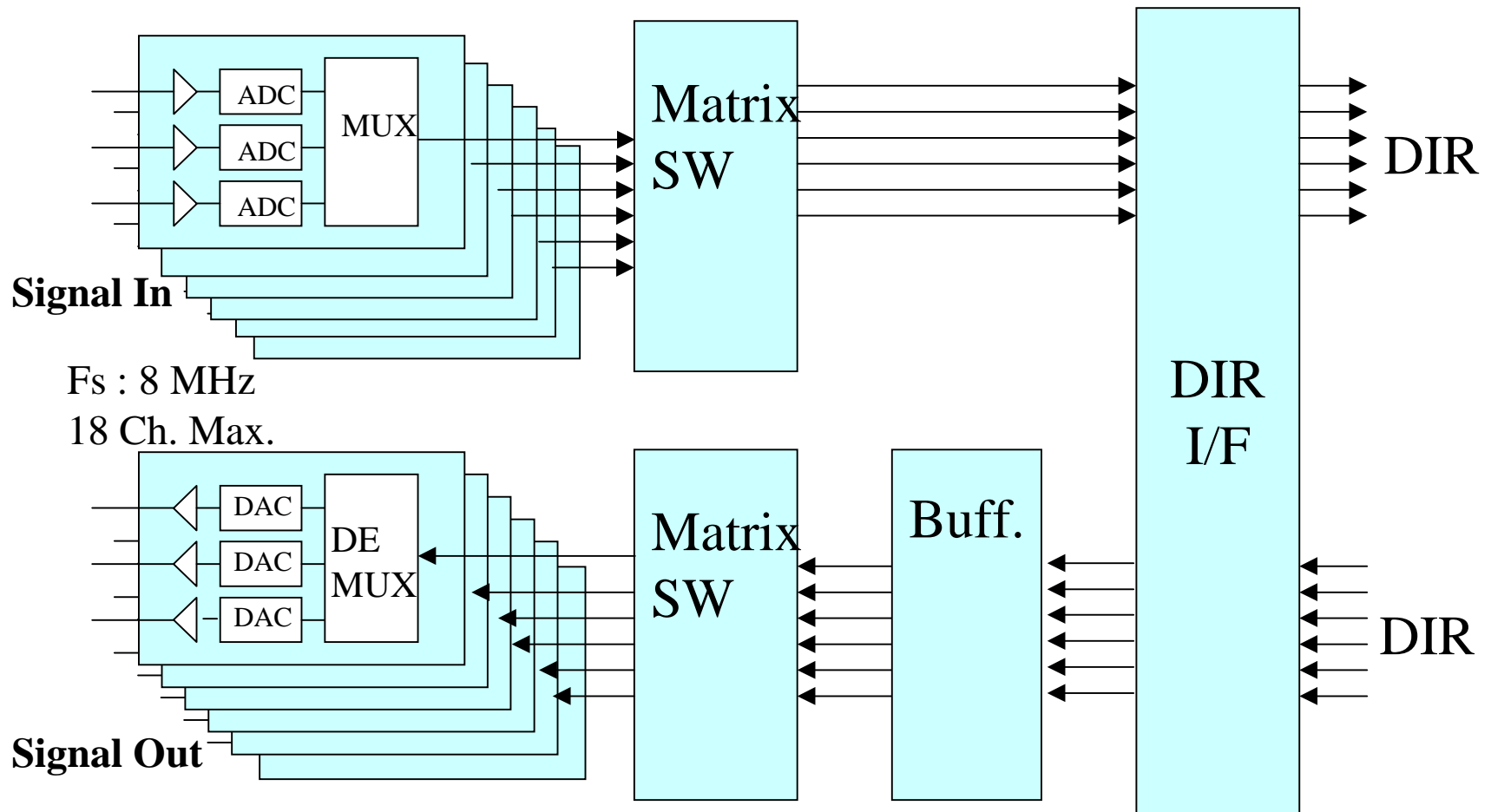
ID-1 Format

Signal I/O



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Configuration (signal)



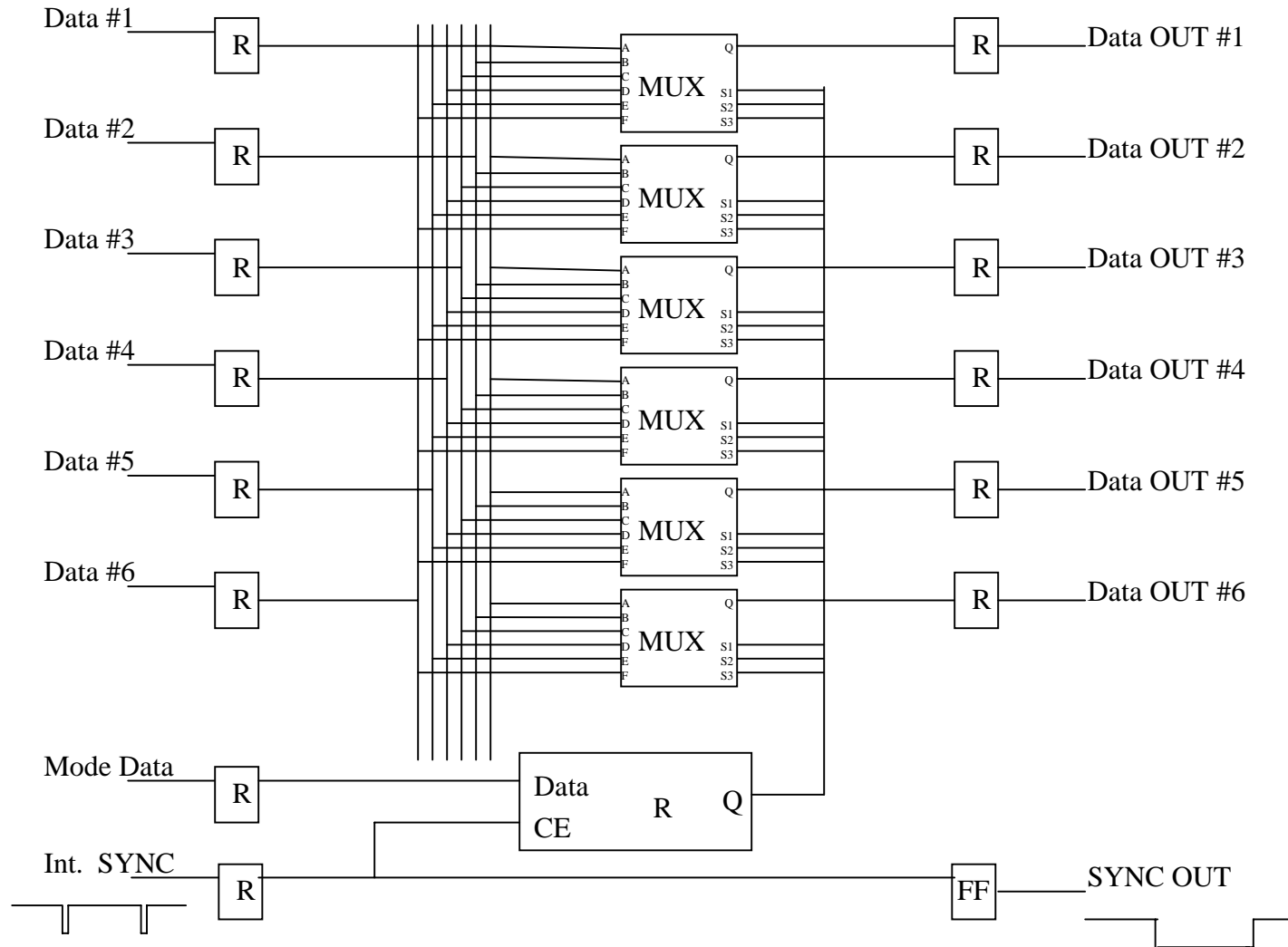
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Analog Interface

- 6 x 3 ch of **10 bits** A/D and D/A converters
 - S/N > 60 dB
- Ultra low harmonic distortion(12 bits ADC)
 - 2nd and 3 rd
- Sampling Frequency of 8 MHz
 - Total bit rate must be 256Mbits/s
- Group Delay Maximum Flat Filter
- 3 channels of digital data were combined into one stream

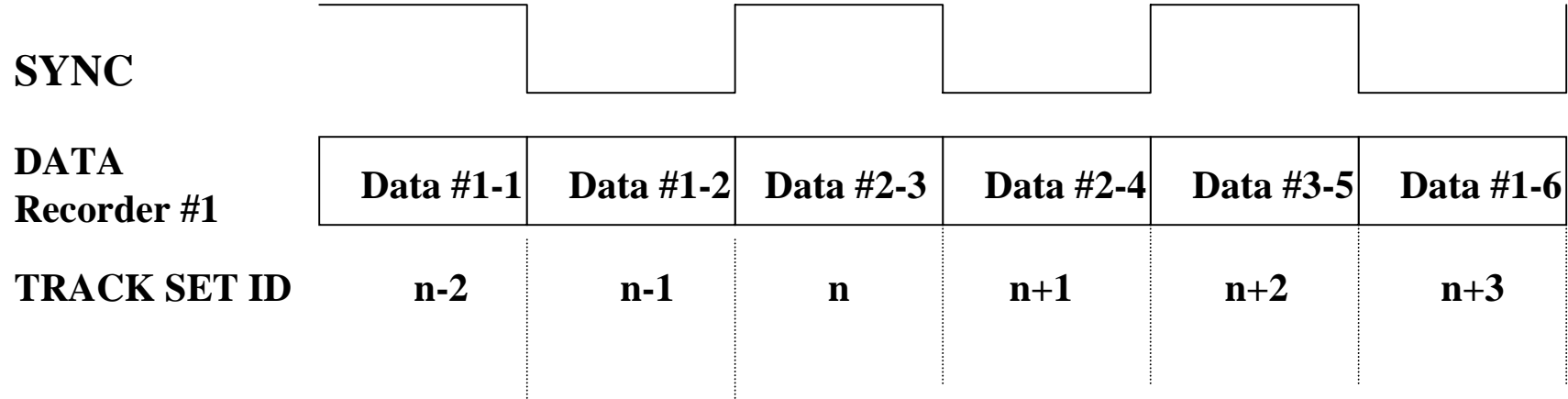
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Matrix SW



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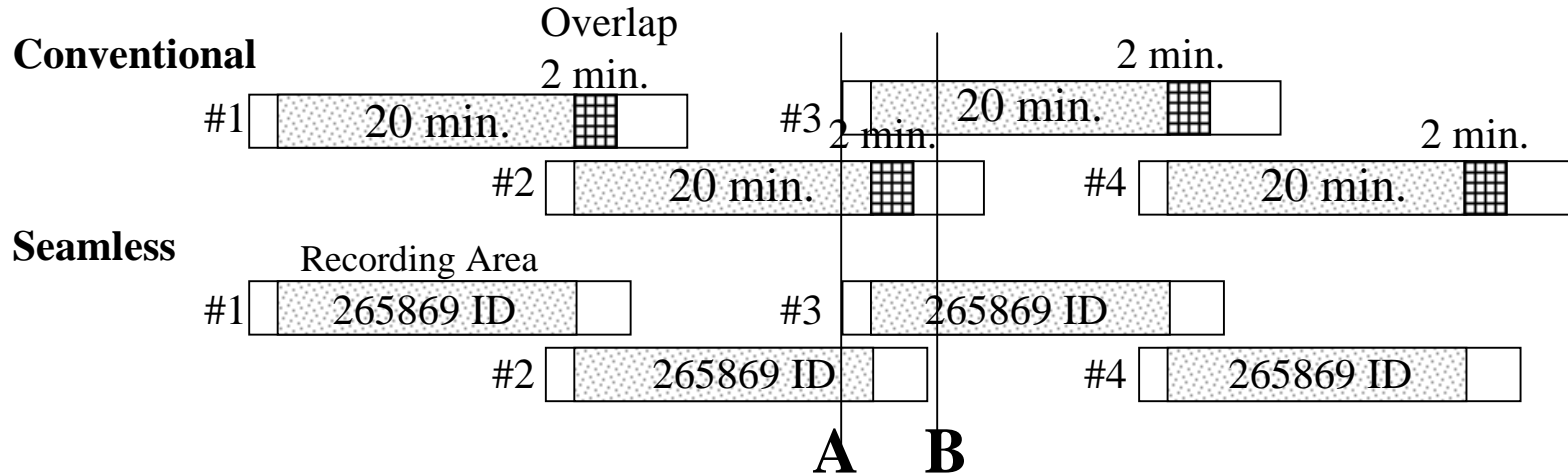
Matrix SW



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Seamless Recording

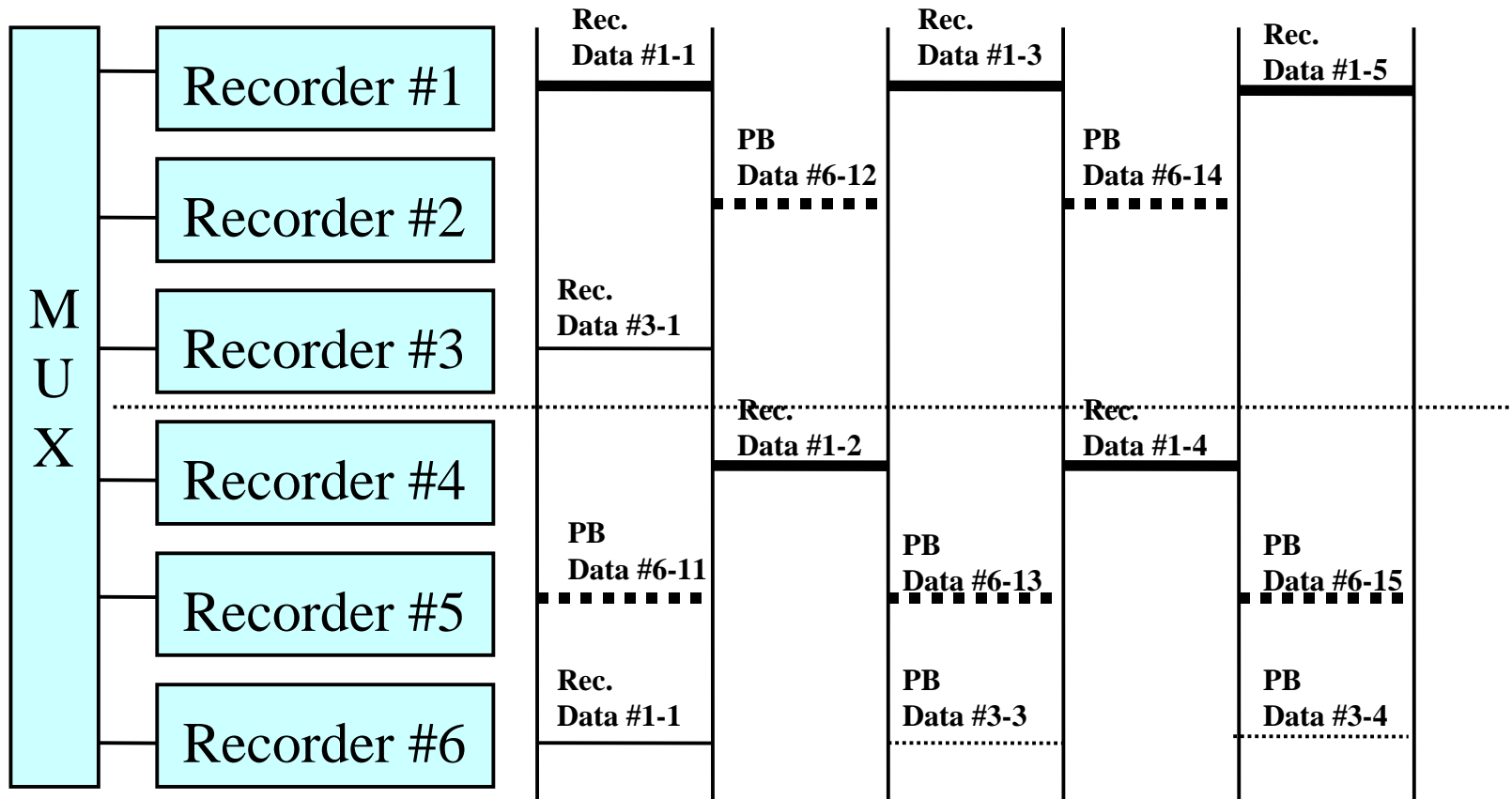
Merit of Seamless Recording



- Can be controlled by Tape number and ID number
- Can be handled as recorded in one tape
- Can reproduce the data continuously regardless data location on Tape
- More efficient in the usage of the tape

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Schedule Example



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SYSTEM Monitor

<< Digital Mass-storage System >>

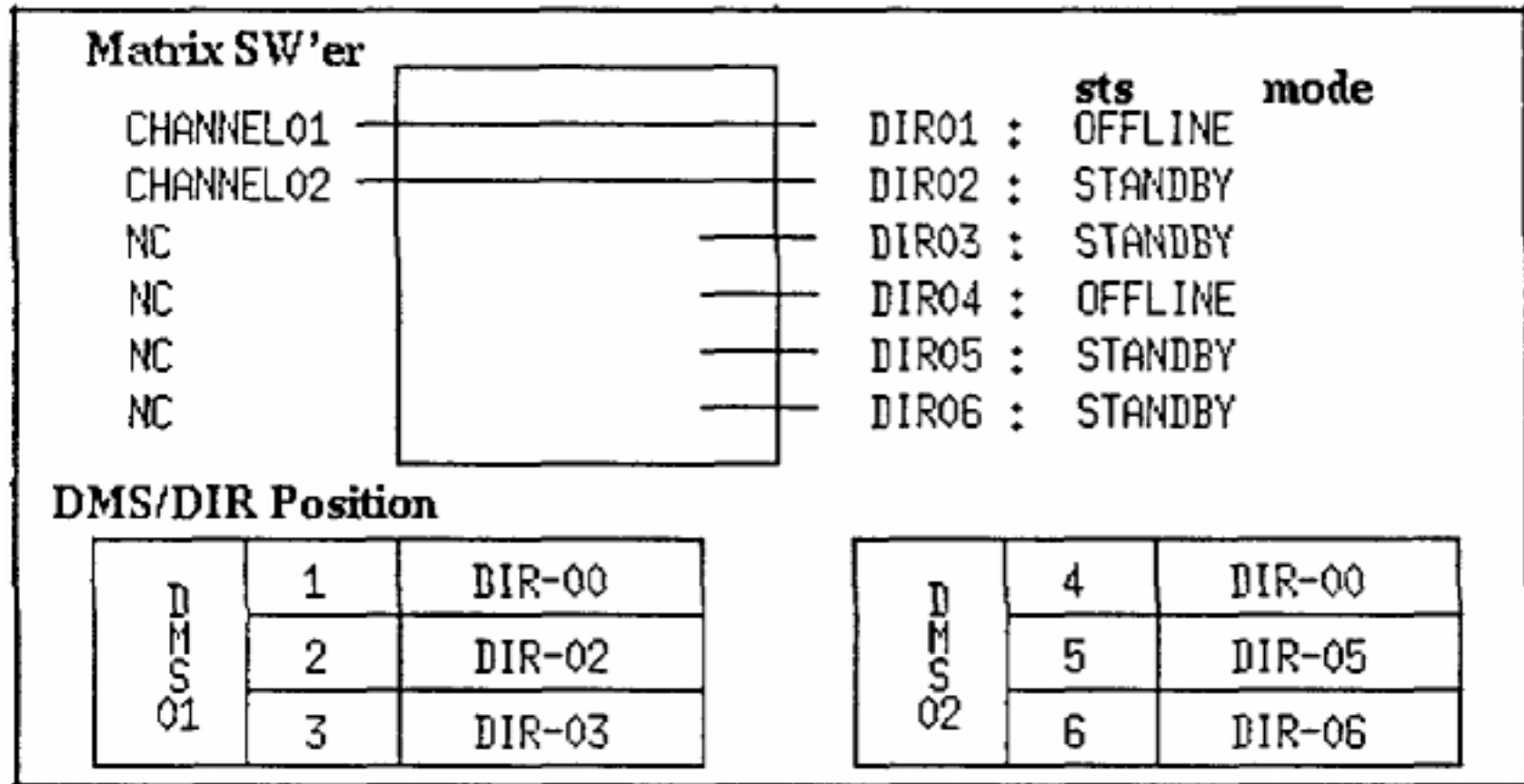
<p>System Mode : mode</p> <p>SCHEDULE EXECUTION : STANDBY</p> <p>IMPORT/EXPORT : ENABLE</p> <p>CASSETTE FORMAT : ENABLE</p> <p>CASSETTE SHAW DAY : 0 日</p> <p>ERROR RETRY TIME : 30 秒</p> <p>T1(Cassette Set up time) : 250 秒</p> <p>T2(Cassette Wind up time) : 150 秒</p> <p>T3(TOSHIBA EH Switching time) : 60 秒</p>	<p>Device Name : sta</p> <p>-----HOST : STANDBY</p> <p>DIKSOLE PC : STANDBY</p> <p>DMS PC : STANDBY</p> <p>DMS-700 #1 : STANDBY</p> <p>DMS-700 #2 : STANDBY</p> <p>IDC PC : STANDBY</p> <p>IDC CONTROLLER : STANDBY</p>	<p>Device Name : sta</p> <p>BIR-CTL 01 : STANDBY</p> <p>BIR-CTL 02 : STANDBY</p> <p>BIR-CTL 03 : STANDBY</p> <p>BIR-CTL 04 : STANDBY</p> <p>BIR-CTL 05 : STANDBY</p> <p>BIR-CTL 06 : STANDBY</p>	<p>1998年 9月 16日 14時 44分 56秒</p> <p>オフライン制御 (ト)</p> <p>DMS操作情報</p> <p>手動制御設定</p> <p>データベース保存</p> <p>視点切替 (ト) スケール切替 (ト)</p>																																																																																																									
<p>Warning Point</p> <p>BIR TOTAL USED TIME : 2000 時間</p> <p>BIR HEAD USED TIME : 500 時間</p> <p>CASSETTE USE PASS TIMES : 500 回</p> <p>DMS AVAILABLE BIN NUMB : 30 個</p> <p>DMS AVAILABLE USE CASSETTE : 10 巻</p> <p>CASSETTE ERROR RATE : 32</p> <p>BIR-1000 ERROR RATE : 32</p>	<p>Matrix Status</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>DeviceL01</td> <td>DIR01 : OFFLINE</td> </tr> <tr> <td>DeviceL02</td> <td>DIR02 : STANDBY</td> </tr> <tr> <td>NC</td> <td>DIR03 : STANDBY</td> </tr> <tr> <td>NC</td> <td>DIR04 : OFFLINE</td> </tr> <tr> <td>NC</td> <td>DIR05 : STANDBY</td> </tr> <tr> <td>NC</td> <td>DIR06 : STANDBY</td> </tr> </table>	DeviceL01	DIR01 : OFFLINE	DeviceL02	DIR02 : STANDBY	NC	DIR03 : STANDBY	NC	DIR04 : OFFLINE	NC	DIR05 : STANDBY	NC	DIR06 : STANDBY	<p>DMS/DIR Position</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td rowspan="3" style="writing-mode: vertical-rl; text-orientation: mixed;">01</td> <td>1</td> <td>BIR-00</td> <td rowspan="3" style="writing-mode: vertical-rl; text-orientation: mixed;">02</td> <td>4</td> <td>BIR-00</td> </tr> <tr> <td>2</td> <td>BIR-02</td> <td>5</td> <td>BIR-05</td> </tr> <tr> <td>3</td> <td>BIR-03</td> <td>6</td> <td>BIR-06</td> </tr> </table>		01	1	BIR-00	02	4	BIR-00	2	BIR-02	5	BIR-05	3	BIR-03	6	BIR-06																																																																															
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<p>Cassette Condition</p> <p>DMS-01 AVAILABLE BIN : 257 個</p> <p>DMS-01 AVAILABLE USE CASSETTE : 60 巻</p> <p>DMS-02 AVAILABLE BIN : 258 個</p> <p>DMS-02 AVAILABLE USE CASSETTE : 59 巻</p>	<p>Schedule</p> <p>----- Rec ----- Play ----- DFFline ----- Abort</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>12 h</td> <td>13</td> <td>14</td> <td>15</td> <td>16</td> <td>17</td> <td>18</td> <td>19</td> <td>20</td> <td>21</td> <td>22</td> <td>23</td> <td>0</td> <td>1</td> <td>2</td> </tr> <tr> <td>CH-01</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>CH-02</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>NC</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>NC</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>NC</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>NC</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>			12 h	13	14	15	16	17	18	19	20	21	22	23	0	1	2	CH-01															CH-02															NC															NC															NC															NC														
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<pre> 1998/09/16 14:40:06< 18213 > プロセスを起動します。 DMS sec_3:SCH Manager 1998/09/16 14:40:06< 18213 > プロセスを起動します。 DMS sec_3:EXE Manager 1998/09/16 14:40:06< 18213 > プロセスを起動します。 DMS sec_2:LOG F,trans 1998/09/16 14:40:06< 18213 > プロセスを起動します。 DMS sec_3:PRM Server 1998/09/16 14:40:07< schmgr : 18223 > プロセスが開始しました。 <schmgr> 1998/09/16 14:40:07< schmgr : 18224 > 実行マネージャー起動 1998/09/16 14:40:07< schmgr : 18223 > スケジューラー初期化と処理 : SCHMGR : <INIT_TAPE START> 1998/09/16 14:40:07< schmgr : 18223 > スケジューラー初期化と処理 : SCHMGR : <DB_tape_findfl START> 1998/09/16 14:40:07< schmgr : 18223 > スケジューラー初期化と処理 : SCHMGR : <DB_tape_findfl END> 1998/09/16 14:40:08< schmgr : 18223 > スケジューラー初期化と処理 : SCHMGR : <INIT_TAPE END> 1998/09/16 14:40:08< schmgr : 18223 > スケジューラー初期化と処理 : SCHMGR : <INIT_SCH START> 1998/09/16 14:40:08< schmgr : 18223 > スケジューラー初期化と処理 : SCHMGR : <DB_sch_findfl START> 1998/09/16 14:40:08< schmgr : 18223 > スケジューラー初期化と処理 : SCHMGR : <DB_sch_findfl END> 1998/09/16 14:40:08< schmgr : 18223 > スケジューラー初期化と処理 : SCHMGR : <INIT_SCH END> 1998/09/16 14:40:08< schmgr : 18223 > カセットチェックを開始します 1998/09/16 14:40:08< schmgr : 18223 > カセットチェックを終了します </pre>																																																																																																												

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SYSTEM Monitor

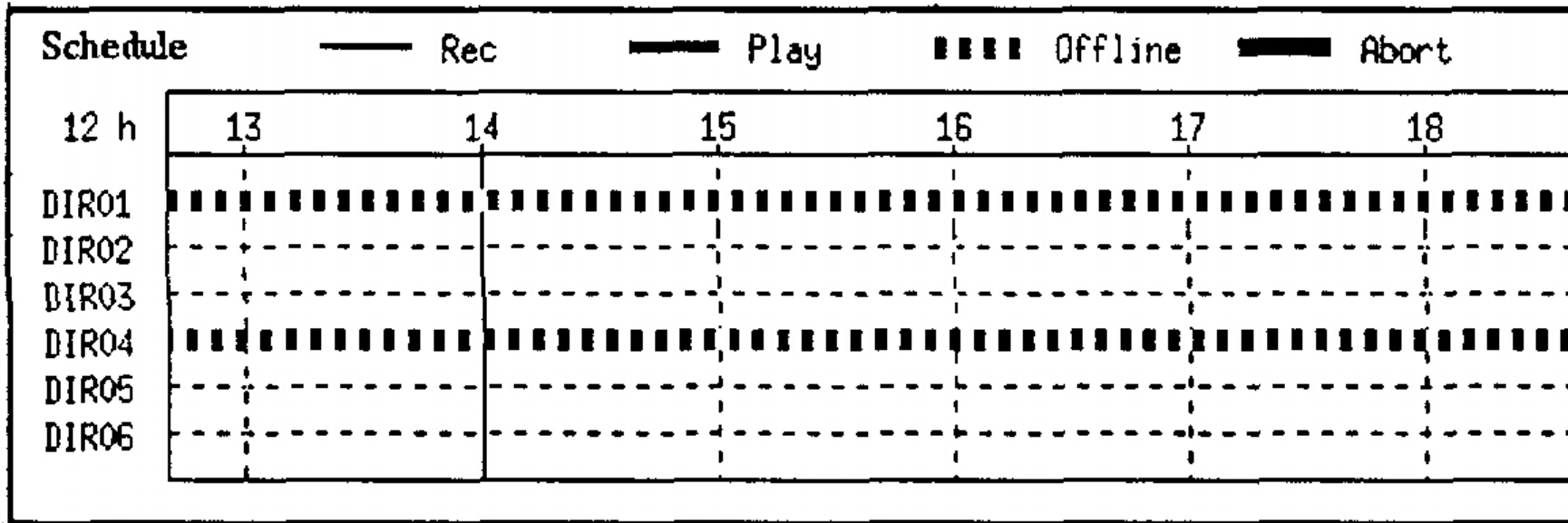
Matrix SW'er / DIR Status



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SYSTEM Monitor

Schedule Information



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SYSTEM Monitor

Device Status

Device Name	sts	Device Name	sts
TECHNICA HOST	: STANDBY	DIR-CTL 01	: STANDBY
CONSOLE PC	: STANDBY	DIR-CTL 02	: STANDBY
DMS PC	: STANDBY	DIR-CTL 03	: STANDBY
DMS-700 01	: STANDBY	DIR-CTL 04	: STANDBY
DMS-700 02	: STANDBY	DIR-CTL 05	: STANDBY
IDC PC	: STANDBY	DIR-CTL 06	: STANDBY
IDC CONTROLLER	: STANDBY		

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SYSTEM Monitor

System Mode

System Mode	mode
SCHEDULE EXECUTION	: STANDBY
INPORT/EXPORT	: DISABLE
CASSETTE FORMAT	: DISABLE
CASSETTE SAVE DAY	: 2 日
ERROR RETRY TIME	: 60 秒
T1(Cassette Set up time)	: 90 秒
T2(Cassette Wind up time)	: 90 秒
T3(TOSHIBA CH Switching time):	: 60 秒

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Conclusion

- Customer is satisfied in this system
 - All Requirement was Achieved
 - 8 Similar System have been installed in Japan during last 6years
 - 2 more systems will be installed in 2000

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