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MR-3 TRIPLE BUS INTERFACE

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UNIT SONY 9 PIN Akai MM1500 Sony PCM7050 DAR SoundStation

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DRAWINGS

MR3FP

Front panel drawing showing KEY and Display functions.

MR3CON

Rear panel drawing showing input/output connectors and typical video interconnection.

PROCLINX

MICROD1A

MRCROD2A

PSU-1

Video reference decoder, reference selection, reference monostable.

PSU-2

Power fail detect, +12 volt, +6 volt, +5 volt, -12 volt regulator circuit, battery backup.

MR3FRAME

Frame drawing showing all cabling.

1.0 DISPLAY

In normal operation the eight digit display will show any of the following:-

Bus Footage Bus timecode

Slave 1 timecode Slave 2 timecode Slave 3 timecode

1.01 BUS timecode

To display Master timecode depress **SELECT** until the **MASTER** LED is illuminated. The current selected Master timecode will be displayed either LTC-IN or System timecode.

1.02 BUS FILM FOOTAGE (User Bits)

To display Reader timecode depress **SELECT** until the FILM F is illuminated.

1.07 STD

READER STANDARD

These LED's will illuminate to indicate the standard of the incoming code when either **READ** or **R.USER** LED's are illuminated.

GENERATOR STANDARD

These LED's will illuminate to indicate the selected standard of the timecode generator when either **GEN** or **G.USER** LED's are illuminated.

Note. See the CONFIGURATION section for the method of selecting the film frame rate and generator standard.

The standards recognised are as follows:-

- 24 24 Frame per second FILM timecode
- 25 25 frame per second EBU timecode
- 29.97 frame per second SMPTE drop frame timecode
- **30** 30 frame per second SMPTE timecode

1.08 COL

This LED will illuminate to indicate that the colour bit is set in the incoming code when either **READ** or **R.USER** LED's are illuminated.

This LED will illuminate to indicate that the timecode generator is colour locked to an external video signal when either **GEN** or **G.USER** are illuminated.

Note: See the CONFIGURATION section for the method of selecting the generator colour lock status.

Not currently available.

1.09 REF

These LED's illuminate to indicate the selected frame rate reference for the timecode generator when set to FREE RUN. The following external references may be selected:-

| XTAL | Internal crystal reference |
|--------|--------------------------------------|
| VIDEO | External composite video input |
| EXT | External frame or 2*frame rate input |
| MAINS | Internally derived mains line |
| READER | Internally derived reader frame rate |

When a reference other than XTAL is selected the LED will flash if the reference is not present. When the generator is locked to the external reference the LED will cease flashing.

Note: See the CONFIGURATION section for method of selecting generator reference.

4.00 UNIT / SLAVE 1 / SLAVE 2 /SLAVE 3 / SLAVE 4 CONFIGURATION

CONFIGURATION SELECTION

The configuration of the unit is selected by first depressing the **SET** key so that the **SET** LED is illuminated then depress both <- and -> simultaneously to enable configuration selection. The first display allows you to select which configuration you wish to adjust **UNIt/SLAVE 1/SLAVE 2/SLAVE 3**. Make your selection and then depress <- and -> simultaneously to select.

4.01 MENU STRUCTURE

| | | SE | ΞT | | | |
|------------------------------|--------------------------------------|----------------------------------|----------|--------|------------|--|
| | CONFIGL | JRATION | TYPE SEI | ECTION | | |
| UNIT | SLAVE-1 SLAVE-2 SLAVE-3 | | | | | |
| | SERIAL COMMUNICATIONS TYPE SELECTION | | | | | |
| PARAMETERS | SONY 9 PIN | SONY 9 PIN DA88 15 PIN STUDER D8 | | R D820 | STUDER TLS | |
| | PARAMETERS | PARAMETERS PARAMETER | | 1ETERS | PARAMETERS | |
| CONFIGURATION TYPE SELECTION | | | | | | |

4.10 UNIT CONFIGURATION

Once in the CONFIGURATION MENU the display indicates either the parameter to be modified or the various selections of a particular parameter as follows:-

SYStd 25 / SYStd 30 / SYStd 24 / SYStd 29d / SYStd 29

SYS rEF

AddrS 01

The < and > keys are used to select the parameter displayed. The **INC** and **DEC** keys are used to change the selection of the displayed parameter.

When the **SET** key is depressed both the CONFIGURATION and SETUP modes are exited. The parameters are then set as selected whilst in setup or CONFIGURATION.

4.11 SYSTEM STANDARD: SYStd 25 / SYStd 30 / SYStd 24 / SYStd 29d / SYStd 29

The system standard may be set to any of the following:-

| 24 | 24 frame per second FILM timecode |
|------|-----------------------------------|
| 25 | 25 frame per second EBU timecode |
| Drop | SMPTE drop frame timecode |
| 30 | SMPTE timecode |

4.12 SYS rEF

4.13 MR3 BASE ADDRESS: AddrS 01

4.20 SLAVE CONFIGURATION

In SLAVE CONFIGURATION the user must first select the protocol to be used :-

| SONY 9P | Sony P2 protocol |
|----------|--|
| DA88 15P | on one port |
| MIDI | Midi Machine Control or Midi timecode output |
| ES BUS | Studer TLS4000 or AK ES 1.11 or Timeline microlynx |

Each protocol then has its own configuration, select the protocol that you wish to use and then enter the configuration by depressing <- and -> simultaneously.

4.30 SONY 9 pin CONFIGURATION

The following selections are available in the sony configuration

0 INPUt / 1 BUU800 / 2 VO9850 / 3PU2800 / 4 SSL SS / 5 dA88 9 / 6 PC7050 / 7 NN1500 / 8 dAr-8 rdy OFF / AudioVid / 8 Track / 16 Track / 24 track / 48 track (REcEn 00) PLAYd 00 **PAr-O 00** LOCAtE01 SHtSPd20 CHASE 00 VARI-PLY / SHUTTLE / VARISPd PAuSECnd / StoP Cnd VidEo tP / dAt 1 tP / dAt 2 tP / DiG tYPE StAtuS / DISAbLE TrYS 00 Error 00 Conn Nid / ConStArt LTC /TinnEr-1/TinnEr-2/ VITC / LTC-VITC / L-V-T (SEr Code / tAch-LtC / tAchOnly) Edit On / REC ON Auto Std / SYS Std

4.31 MACHINE SELECTION

0 INPUt / 1 BUU800 / 2 VO9850 / 3PU2800 / 4 SSL SS / 5 dA88 9 / 6 PC7050 / 7 NN1500 / 8 dAr-8

This selection is used so install factory defaults, If a new machine is selected exit setup before continuing so that the defaults may be installed.

NOTE. 0 INPUt should NOT be used!

4.32 RECORD ENABLE TYPE:

This selects both the record enable command an the ready data request sent to the machine as follows:-

| rdY OFF | No Record ready command or data request |
|----------|---|
| AudioVid | Video machine with maximum of four audio charnels |
| 8 Track | DAT/DA88 8 Digital audio charnels maximum |
| 16 Track | MM1500 with 16 Digital audio charnels maximum |

4.33 START UP TIME FROM STOP: PLAYd 00

Chase Type 3,4,5 Only

This parameter defines the startup time from pause in frames, if the master is moving at play speed then the play command is sent to the controlled machine when the master is **PLAYd** frames ahead of the controlled machine.

4.34 PARK OFFSET: PAr-O 00

Chase Type 3,4,5 Only

This parameter defines the park ahead offset in seconds. When the master stops the controlled machine will park **PAr-O** frames ahead of the master. This allows for lace-up times on machines that time-out.

4.35 LOCATE RESPONSE: LOCAtE00

Chase Type 3, 4, 5 Only. LOCAtE00 = Tapeless, 01 = Fast, 02= Normal, 03= Slow, 04 = Very Slow

When chasing a moving master this parameter determines the locate response of the controlled machine. Increasing this parameter increase the approach speed, If this parameter is to low then the controlled machine will not catch up with the master, if this parameter is to high then the controlled machine will overshoot the master.

4.36 MAXIMUM SHUTTLE SPEED: SHut Spd

When controlling the machine from the keyboard, this parameter determines the shuttle speed on receiving a laced forward/reverse wind command. The maximum shuttle speed is limited by the machine.

4.37 CHASE TYPE: CHASE 00

In order to cope with a number of different machines the following chase algolrythmns are available:-

- CHASE 00 MACHINE CHASE, Issue CHASE Command to MACHINE
- CHASE 01
- CHASE 02

CHASE 03 MR-3 chase, Lock 1 frame Behind, pull to frame and release to video.

- CHASE 04 MR-3 chase, Lock 1 frame Ahead, pull to frame and release to video.
- **CHASE 05** MR-3 chase, Lock to frame and release to video.

4.38 VARISPEED COMMAND: VARI-PLY / SHUTTLE / VARISPd

This parameter determines the command used to varispeed the controlled machine by the MR-3 three alternatives are provided:-

| VARI-PLY | Variable speed play |
|----------|--|
| SHUTTLE | Shuttle |
| VARISPd | Programable speed play (This will change to PROG-PLY) |

4.39 STOP/PAUSE COMMAND: PAuSECnd / StoP Cnd

This parameter determines the command used when a stop command is received:-

PAuSECndShuttle at zero velocitySTOP CndStop

4.3A NUMBER OF LOCK ATTEMPTS: TrYS 00

Chase type 3,4,5 only.

Number of attemptrs for zero error, 00 = infinite, 01 = 1 try...

When controlling machines using the sony protocol the controlled machine is released to lock to video syncs. A conflict can occur between the frame edge of the video and the frame edge of the timecode when there is a subframe timecode offset or colour framing is enabled on a VTR.

4.3B MAXIMUM ALLOWABLE ERROR: Error 00

Chase type 3,4,5 only.

After attempting zero error for the number of attempts specified in 4.3A provided the error stays within the error window no further attempt will be mde to synchrnise

4.3C POSITION REQUEST TIMING: Conn Nid

4.3D POSITION REQUEST TYPE: SEr Code / tAch-LtC / tAchOnly

4.3E RECORD COMMAND TYPE: Edit ON / REC ON

4.3F TIMECODE STANDARD: Auto Std / Sys Std

4.40 TASCAM 15P CONFIGURATION

8 trAC / 16 trAC / 24 trAC / 32 trAC / 40 trAC / 48 trAC PLAYd 00 PAr-O 00 SHtSPd20 CHASE 00 Conn Nid CHASE 00 POZ-COdE / POZ- AbS

4.41 NUMBER OF DA-88's CONNECTED

4.42 START UP TIME FROM STOP: PLAYd 00

This parameter defines the startup time from pause in frames, if the master is moving at play speed then the play command is sent to the controlled machine when the master is **PLAYd** frames ahead of the controlled machine.

note: This parameter is only used when the MR-3 is controlling the chase, see section 4.37 CHASE TYPE.

4.43 PARK OFFSET: PAr-O 00

This parameter defines the park ahead offset in seconds. When the master stops the controlled machine will park **PAr-O** frames ahead of the master. This allows for lace-up times on machines that time-out.

note: This parameter is only used when the MR-3 is controlling the chase, see section 4.37 CHASE TYPE.

4.44 MAXIMUM SHUTTLE SPEED: SHut Spd

When controlling the machine from the keyboard, this parameter determines the shuttle speed on receiving a laced forward/reverse wind command. The maximum shuttle speed is limited by the machine.

4.45 CHASE TYPE: CHASE 00

In order to cope with a number of different machines the following chase algolrythmns are available:-

| CHASE 00 | In this mode the machine chase only is used |
|----------|---|
| CHASE 01 | |
| CHASE 02 | |
| CHASE 03 | MR-3 chase, follow locate commands. Pull into lock from behind only. |
| CHASE 04 | MR-3 chase, follow locate commands. Pull into lock from ahead only. |
| CHASE 05 | MR-3 chase, follow locate commands. Pull into lock from either direction. |
| | |

4.46 POSITION REQUEST TIMING: Conn Nid

4.47 TIMECODE / ABSOLUTE TIME: POZ-COdE / POZ- AbS

4.50 MIDI CONFIGURATION

Not yet implemented

4.60 ES BUS CONFIGURATION

Not yet implemented

4. USER CONFIGURATION TABLE**

When installing new software or after a **HARD RESET** it is important that the configuration of the unit remains the same. This sheet is provided for that purpose, please write down the current configuration so as to be able to reset the unit correctly. Remember that the next engineer to use the unit may not be a fully understand why it has been set up in this way!

UNIT CONFIGURATION

| Setting | Nominal | Options |
|---------|----------|-------------|
| | 25 | SYS Std 24, |
| | Video | SYS rEF Vi |
| | AddrS 01 | 116 |

SYS Std 24, 25, 29, 30 SYS rEF Video, External, BUS 1...16

SONY 9 PIN Akai MM1500

| Setting | Nominal | Options |
|---------|----------|--|
| | 7 NN1500 | 0 INPUt / 1 BUU800 / 2 VO9850 / 3PU2800 / 4 SSL SS / 5 |
| | | dA88 9 / 6 PC7050 / 7 NN1500 / 8 dAr-8 |
| | REcEn 03 | REcEn 0004 |
| | PLAYd 00 | PLAYd 00020 |
| | PAr-O 00 | PAr-O 00 |
| | LOCAtE01 | LOCAtE01 |
| | SHtSPd20 | SHtSPd20 |
| | CHASE 00 | CHASE 00 |
| | VARISPd | VARI-PLY / SHUTTLE / VARISPd |
| | StoP Cnd | PAuSECnd / StoP Cnd |
| | TrYS 00 | TrYS 00 |
| | Error 00 | Error 00 |
| | Conn Nid | Conn Nid / C Start |
| | SEr CodE | SEr CodE / tAch-LtC / tAchOnly |

Notes:-

1) This machine does not accept the following commands: **Chase On/Off, Offset** 2) Record Ready commands, When in RECORD the MM1500 accepts record en

When in RECORD the MM1500 accepts record enable commands but does implement them (The serial tallies show the channels enabled but they are not enabled on the MM1500).

SONY 9 PIN Sony PCM7050

| Setting | Nominal | Options |
|---------|------------|--|
| - | 6 PC7050 | 0 INPUt / 1 BUU800 / 2 VO9850 / 3PU2800 / 4 SSL SS / 5 |
| | | dA88 9 / 6 PC7050 / 7 NN1500 / 8 dAr-8 |
| | _ REcEn 02 | REcEn 0004 |
| | _ PLAYd 00 | PLAYd 00020 |
| | PAr-O 00 | PAr-O 00 |
| | LOCAtE01 | LOCAtE01 |
| | _ SHtSPd20 | SHtSPd20 |
| | CHASE 00 | CHASE 00 |
| | VARISPd | VARI-PLY / SHUTTLE / VARISPd |
| | _ StoP Cnd | PAuSECnd / StoP Cnd |
| | _ TrYS 00 | TrYS 00 |
| | _ Error 00 | Error 00 |
| | Conn Nid | Conn Nid / C Start |
| | _ SEr CodE | SEr CodE / tAch-LtC / tAchOnly |

SONY 9 PIN: DAR Soundstation

| Setting | Nominal | Options |
|---------|----------|--|
| | 7 NN1500 | 0 INPUt / 1 BUU800 / 2 VO9850 / 3PU2800 / 4 SSL SS / 5 |
| | | dA88 9 / 6 PC7050 / 7 NN1500 / 8 dAr-8 |
| | REcEn 02 | REcEn 0004 |
| | PLAYd 00 | PLAYd 00020 |
| | PAr-O 00 | PAr-O 00 |
| | LOCAtE01 | LOCAtE01 |
| | SHtSPd20 | SHtSPd20 |
| | CHASE 00 | CHASE 00 |
| | VARISPd | VARI-PLY / SHUTTLE / VARISPd |
| | StoP Cnd | PAuSECnd / StoP Cnd |
| | TrYS 00 | TrYS 00 |
| | Error 00 | Error 00 |
| | Conn Nid | Conn Nid / C Start |
| | SEr CodE | SEr CodE / tAch-LtC / tAchOnly |

Notes:-

1) This machine does not accept the following commands:-

Emulation with timecode chase

1) In this mode the DAR does not accept **RECORD ON** or **RECORD OFF** commands Full emulation

1) In this mode the DAR will only accept ready channel selection when stopped.

STUDER TLS CONFIGURATION Auto / A810 2t / A820 2t / A820 24t / A807 2t rdy OFF / 2 trAc / 24 trAc SYNC / PLAY REPEAT C / Cnd OnlY

STUDER D820 CONFIGURATION rdY OFF / d820 48t / d820 24t

6.00 **RESET**

6.01 POWER UP RESET

When switched on the unit will reset, On reset the memory is not completely cleared since the current film position, timecode offset, and configuration are battery backed. If a memory backup failure is detected the unit will reset the whole memory. During the power up sequence the LED Display will show the following:-

| LEd Good | This indicates that the CPU, ROM, LED display, and driver are working |
|----------|--|
| | correctly. |
| Ran Good | This indicates that the RAM has been checked and is good. |
| RAn BAd | This indicates that the RAM has been found to be bad. |
| bC12 | This is the revision code of the software |
| HArd rSt | This indicated that an error was found in the configuration ram and that the |
| | |

6.02 CPU CARD RESET

When servicing the unit it may be required to reset the unit without switching off the power. To do this short the two pins on the front of the PROCESSOR BD labels SW1. This will reset the unit in the same way as a power up reset.

6.03 SOFT RESET

A power up reset may be initiated from the front panel by a simultaneous depression of the **SELECT** and **SET** keys.

6.04 HARD RESET

If it is required to reset the battery backed memory manually a hard reset may be initiated from the front panel by simultaneous depression of the **SELECT** and **SLAVE2** keys. This may be necessary when new software is fitted. CAUTION this will wipe the Configuration memory! If the front panel software is not working correctly the unit will only reset if the **SELECT** and **SLAVE2** keys are depressed during the power up sequence.

6.05 MANUAL HARD RESET

The front panel hard reset is only possible if the front panel software is running correctly. If all else fails switch off the power, open the unit, and unplug the PROCESSOR BD. This will disconnect the memory from the backup battery. Replace the PROCESSOR BD, and power up the unit.

8.00 REAR PANEL CONNECTIONS

8.01 POWER INPUT

The unit may be switched for either 220-250v A.C. or 110v-125v A.C. operation. The mains IEC input socket contains an integral power line filter and mains switch. The mains lead supplied should be connected as follows:-

Brown Live Blue Neutral Green/Yellow Earth

8.02 INPUT XLR

The 3 pin XLR INPUT socket is a balanced input to the timecode reader. The input is connected as follows:-

| Pin 1 | Chassis |
|-------|----------------|
| Pin 2 | Positive Input |
| Pin 3 | Negative input |

When connected to an unbalanced source of timecode the connection should be made as follows:-

| INPUT | SOURCE |
|-------|---------------|
| Pin 1 | Chassis |
| Pin 2 | Signal |
| Pin 3 | Signal Ground |

8.03 OUTPUT XLR

The 3 pin XLR OUTPUT plug is a loop through from the Time Code input XLR

8.04 EXT. REF. BNC

The EXT REF BNC is connected to the reference input of the time code generator. This input when selected should be fed with either frame rate or twice frame rate signal. The preferred input is a 5 volt square wave, but a 5v sine wave is also acceptable.

8.05 VIDEO REF. BNC's

The two VIDEO REF BNC's are connected in parallel and routed to the reference input of the time code generator. This input when selected should be fed with a nominal 1 volt composite or black and burst video signal. The input has an impedance of approximately 100K.

The video input will normally be fed from station sync's in parallel with the video recorder's. In an audio studio there is normally a Sony F1 or equivalent which may be used as a source of station

8.06 BUFFERED TIMECODE OUTPUT BNC's

8.07 BUS INPUT 9 pin 'D' FEMALE

8.08 SLAVE 1, 2, & 3 OUTPUTS. 9 pin 'D' FEMALE

9.00 EPROM PRESETS

The hard reset parameters may be preset by changing values in the EPROM.

9.01 SYSTEM TIMECODE STANDARD

| Address | EPROM | |
|---------|--------|----------------------------|
| \$FFE0 | \$7FE0 | 0= EBU (25), 1= SMPTE (30) |

9.02 SLAVE SERIAL PROTOCOLS

The serial protocol for each RS422 output as follows

- 0 = Sony P2
- 1 = Tascam DA-88 15 pin
- 2 = Studer D820 point to point ES-BUS
- 3 =Studer TLS4000
- 4 = Timeline Lynx (Ampex VPR-3)
- 5 = Audio Kinetics ES 1.11 or ES 1.12 ES-BUS protocol

| Address | EPROM | |
|---------|--------|------------------|
| \$FFE1 | \$7FE1 | Slave 1 Protocol |
| \$FFE2 | \$7FE2 | Slave 2 Protocol |
| \$FFE3 | \$7FE3 | Slave 3 Protocol |

9.03 UNIT BASE ADDRESS

| Address | EPROM | |
|---------|--------|---|
| \$FFE4 | \$7FE4 | 1 = Address 1, 4 = Address 4, 7 = Address 7 |