S.two

Digital Field Recording

D.MAG™

Digital Data Magazine Recording System

User Manual

D.MAG-18 RGB™	- 18 minute Digital Magazine
D.MAG-36 RGB™	- 36 minute Digital Magazine
DFR RGB™	- HD 4:4:4 Portable Video Recorder
E.DOCK™	- Network Attached D.MAG Docking Station
A.DOCK™	- Archiving Docking Station
C.DOCK™	- Cloning Docking Station
F.DOCK™	- Fibre Channel Docking Station

S.two Incorporated.
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This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the Operations Manual, may cause interference to radio communications. It has been designed to and found to comply with, the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user, at his expense, will be required to correct the interference.

CE Mark Conformance

These S.two Corp. products conform to the European Community CE Mark Standard for the design and manufacturing of information technology equipment. This standard covers a broad area of product design, including RF emissions and immunity from electrical disturbances.

Manual Organization

This manual is organized into user groupings for fast access to the material that you may want to know or need to know, before operation or once you have started to use the unit. The D.MAG system has been designed to be an intuitive, easy to use set of devices that lead the user through the process. This manual is therefore more of a reference tool than a tutorial although it does contain both approaches.

The first section deals with setting up a DFR unit, connections and environmental conditions.

The second section is an overview of the D.MAG magazine and the data structures used along with the display screen.

The third section concerns the main user interface running on a PDA with ARM Linux operating system and custom control software. This section also covers use of the DFR via network interfaces and operating the control programming from remote login devices. Much of this manual is concerned with the interface program called DMAG-remote. This details almost all of the operating features and user settings for the DFR.

Section Four discusses the docking stations and their operation including putting data to and from the D.MAG magazines. See the Docking Station Manual for more information.

The appendices contain additional information on DFR and D.MAG including data on cables and connectors, version tracking of software and manual, optional transport cases and third party interfaces.

Table of Contents

The D.MAG™ System – Overview.

D.MAG™ is a complete solution for the recording of higher definition images on location, in the studio, or in any portable application where typically film has been used. D.MAG represents a fresh approach to the problems inherent with capturing uncompressed data in a portable situation, using that data on set, and then moving and using that data in a post environment. The system provides a complete workflow model that also addresses the requirements of moving, sharing and using uncompressed images throughout a production workflow, including final output to film or other media.

The heart of the D.MAG system is the D.MAG digital film magazine. This small, lightweight pack is the digital 'film'. The D.MAG magazine is a removable storage module that mates with the other solutions in the D.MAG product range, all of which are designed to specifically address the needs of the production community. The D.MAG is rugged and ready for use in any situation that may arise with uncompromising performance under extreme conditions.

D.MAG magazines hold either 18 or 36 minutes of uncompressed HD RGB images @ 1920 x 1080 plus all the metadata, audio and other information required. The D.MAG can support resolutions higher than HD at real-time rates so that it can remain an industry standard long into the future. The magazine has also been designed for a long service life, featuring low insertion force connectors rated at hundreds of thousands of connect / disconnect cycles.

The D.MAG system starts with the DFR™. This is a field portable, uncompressed real time recorder that features DC power, dual link HD RGB support, up to eight channels of uncompressed digital audio, wireless PDA control, and many other useful production tools for a total recording package.

The DFR has the feature set required in any film shoot, including full timecode support, a variety of analog and digital HD and SD video picture display with timecode to drive monitors around the set, and even circle take functions to mark successful 'print' takes for later use in the production process. The DFR allows the user to select the file format he wants to use. Using computer file formats for recording allows images to be used in their native format right in a workstation application without ingest time. Allied with a variety of erase functions this makes saving all records or just some easier to manage.

Once recorded, D.MAG digital film images can be played back on set in either HD or using the built in down converter option to SD for offline tape creation, or shipped back to the studio or 'digital lab' where magazines can be offloaded and cycled back to the field, or held in vaults until the post process begins. D.MAG can be used in a variety of ways in the post process using different D.MAG mounting products.

The E.DOCK docking station is a network-connected studio docking station for D.MAG magazines. Featuring multi-port Gigabit Ethernet high-speed connectivity, the E.DOCK provides plug-and-play D.MAG access from most computer applications, regardless of host operating system or file system.

E.DOCK allows the user to mount a D.MAG digital film magazine as a network resource and share those files around a LAN or WAN. E.DOCK also supports fast file transfers though the use of 'jumbo frames' so that on a dedicated Gigabit Ethernet connection data can flow at the maximum transfer rate. Jumbo frames are supported by a variety of operating systems.

E.DOCK is completely configured prior to shipping for a fast plug and play installation.

A.DOCK is a studio archiving docking station featuring an internal disk array for fast offloads of magazines as a buffer to an attached SCSI data tape library. Use A.DOCK for making uncompressed data tapes on set or in studio.

A.DOCK–V adds real time HD video playback to basic A.DOCK functionality for creation of video tape dailies or playback of DPX files to monitors or projectors.

The C.DOCK is a studio cloning station for D.MAG Magazines. The C.DOCK has two D.MAG receivers for faster than real time copying of the magazine for data security. Use C.DOCK for fast copying of DMAGs and for multiple user / multiple stream network access.

C.DOCK–F is a C.DOCK with Fibre Channel connectivity for use with Storage Area Networks (SAN).

D.MAG system provides a complete data solution for real time and non real time image data storage, distribution and use.

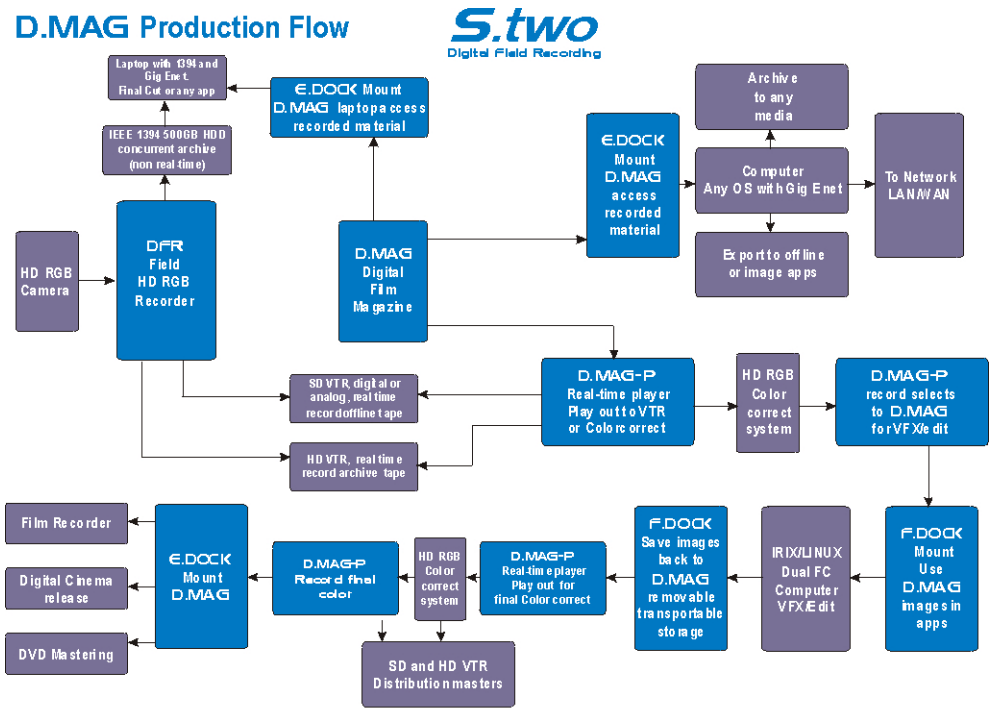


Figure 1 system workflow

Specification

DFR

Video	
Input	**Video Formats**
HD SDI SMPTE 292M	**SMPTE 274M 1920 x 1080 Y, Pr, Pb**
HD SDI Dual-link SMPTE 372M	**Frame rates-10 bit 23.98, 24, 25, 29.97, 30 P, PsF & I**
Option SD SDI ITU-R 656	**Dual Link 1920 x 1080 / 1280 x 720 - RGB**
Sync Tri-level / Bi level	**Frame rates-10 bit 23.98, 24, 25, 23.97 30 P, PsF & I**
	SMPTE 296M 1280 x 720 Y,Pr,Pb
Output	**Frame rates-10 bit 24, 50, 60P**
SMPTE 292M	
SMPTE 372	**Interface**
HD Analog YUV/RGB	**RS422, Sony protocol**
XVGA HD RGB	**USB 2.0 universal serial bus**
SD SDI SMPTE 656	**Gigabit Ethernet RJ 45 x 2**
SD Analog Comp/YUV/RGB	**IEEE 1394 'Firewire'(option)**
	GPIO on 26 pin connector (option)
Audio	**Camera connector – (option)**
AES/EBU 48kHz 24Bit 6/8 channels 110Ω unbalanced	**802.11b Wireless (option)**
1\4 inch stereo jack headphone output	
3.5mm mini stereo jack headphone output	
	Power
Temperature (operating) 5~55° C	**24V DC Nominal 22-33VDC range**
21" (H) x 10 (D) x 16(W)	**Dual 'PowerCon' connector**
42~44lbs (dependant on options fitted)	**Power Draw (operating) <10 Amps**
Shock – Operating- Max 15g @ 11 msec	
Vibration – Operating – 5-500Hz @ 0.5G	

D.MAG 18

18 minutes storage @ 1920 x 1080 24P RGB	**Momentary screen button**
On board Battery back up	**Low insertion force connections**
2 x 24 LCD screen	**15lbs**
Shock – Non operating – Max 75 G @ 11msec	**Vibration – Non operating – 22-500hz @ 2G**

Section One – Installation and Set Up

DFR – Unpacking and setting up

The DFR is shipped ready to go in a hard-sided flight case. The AC Adapter is shipped in the D.MAG magazine receiver. We suggest that the DFR is always shipped with the AC adapter in place as this protects the magazine receiver capture pins. Also in the DFR case are the power cables and 26 pin option cable. Manuals and controls as well as S.two program CD are shipped in separately.

Figure 2 DFR

The system is designed to be used either laying on its back or standing up. However, it can operate in any position. The main concern is airflow. The DFR has side-to-side venting and fans. The fans at the topside are for airflow to the D.MAG magazine; this should not be covered or restricted in any way. The main venting and fans on the side should also be open and reasonably unrestricted.

The DFR features a 'quiet mode', which spins the fans down to an idling near silent mode during active records. This is invoked via the PDA option set up menu. This is for sound recording when the fan noise may become intrusive. (See: option set up menu).

There are two models of DFR, HD and HD RGB. The HD model differs by having as standard 6 channels of digital audio, no dual link or key channel support. The HD-RGB model is supplied with 8 channels of digital audio as an option, dual link native support, 2K HSDL 24 frame as an option.

A DFR can be upgraded to DFR RGB. Contact your local sales or support agent.

DFR main LCD status screen

The DFR has a 2 line 40-character status display. It is backlit for maximum readability; this light can be turned off in record mode if desired.

The screen reflects all states of the DFR during operation including format settings, record and play modes, option settings and error messages. The user attention is drawn to his display if he encounters any problems as it will give an error report for instant problem solving.

Figure 3 Main LCD status display DFR

If the system is being used without a PDA then the main status LCD will show the user the profile used and any other information appropriate to the use of the DFR.

A complete list of messages can be found in the appendix.

Installing a D.MAG Magazine

The D.MAG digital film magazine system is a compact, robust cartridge that stores uncompressed moving images as data. It contains a number of hard disk drives. The D.MAG is available in either HD or HD RGB data capable magazines with 18 or 36 minute recording depths.

The model of the D.MAG is shown on the rear panel. A D.MAG RGB can be used in a HD DFR system; a D.MAG HD cannot be used in a DFR RGB system. The difference is the recording density available from one to the other.

Figure 4 D.MAG front

The DFR is shipped without a magazine installed. A magazine is slid in to the slot above the main LCD screen on the DFR.

Figure 5 DFR Receiver and D.MAG orientation

The D.MAG goes into a receiver; it is intentionally a tight fit. Check that the slot is clean and has no debris blocking the way, do not force the magazine,. The D.MAG orientation is such that the words should be right way up when the main DFR LCD is below the D.MAG. The D.MAG has two thumbscrews that should be tightened to make sure the magazine stays in.

D.MAG Magazine Connector

Figure 6 D.MAG rear panel

The D.MAG has a low insertion multi-pin socket on the rear. This lines up with a plug on the receiver. The plug has moving pins that mate securely when the two parts are lined up. This plug and socket is rated for many hundreds of thousands of insert cycles so will be robust for many years of use.

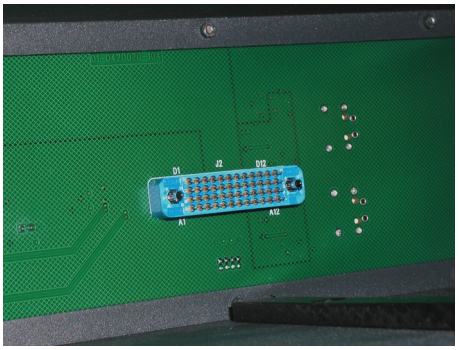


Figure 7 D.MAG Receiver

Make sure the pins in the receiver and on the D.MAG itself are clean and free of any debris. This connection carries the data and control and programming interface signals for the D.MAG on board LCD plus all the power requirements

PDA – Control of DFR

All set up and control of the DFR can be done via the optional PDA. The remote program is designed to lead the user through the set up and use of the system. The main control and set up of the DFR is via the DMAG-remote program loaded as the default application on the PDA. It is not recommended to use the PDA for other programs or uses.

The DFR will operate without the PDA connected. It will set up using the factory default or follow the settings for the magazine.

Figure 8 iPAQ

The iPAQ is preloaded with S.two D.MAG program as its default application. It is not advised to use this PDA for other purposes. The PDA is supplied as either a wireless connection using 802.11b standard signals, USB 2.0 or via a serial cable connection.

It is recommended to fully charge the iPAQ before using it.

The PDA normally run over the USB connection. It is not recommended to have both the serial and USB connected at the same time. The USB connection is actually a network one as far as protocol is concerned. The USB can also supply power when using a cable connection rather than the cradle connection.

The iPAQ PDA can also plug into the multi-pin camera accessory socket using serial connections. This socket supports camera triggers and tally as well as iPAQ serial control via a Y split cable (supplied). The serial standard option supplied with the unit can be upgraded later to a wireless connection at a local S.two service center.

When the wireless option is ordered, the PDA can be used either as wireless or cable. The wireless antenna (supplied with option) is demountable for shipping. The antenna screws directly to the SMA connector on the connection option panel. The Antenna can be oriented in any direction to ensure the best reception. Operating distance from the unit of the PDA will vary with the environment. If the wireless cannot make a strong connection use the serial or run in default non-control mode.

Connections

The DFR features industry standard connections throughout allowing it to be compatible with the maximum number of video products available. Each section of the panel is discussed below.

Figure 9 DFR connector panel

DFR Connection panel showing optional LCP remote connector that replaces the IEEE1394

Power

Figure 10 Power connections

Power connections on the DFR are 24V DC. The voltage is internally regulated and will accept a range of 22V DC to 36V DC. The cable connector mate is a Neutrik Powercon NAC 3 FCA screw terminal locking mating type. The L terminal is Live, the N terminal is neutral. The center connection is not used.

The D.MAG AC Adapter features universal AC input 100~250V AC 50/60Hz. It does not require any switching to change input voltages. The DC output is a Neutrik 'PowerCon' connector for 24V. A variety of power cable lengths can be ordered for use with the D.MAG system. Please contact your local S.two service and sales facility. The DMAG AC Adapter is designed to be used externally to the unit, make sure that there is good airflow to the device when operating. The DMAG AC adapter fits into a DMAG receiver for shipping. This will protect the DMAG receiver connections.

External batteries can be connected using any of the DC inputs, we recommend not less than a 10aH device. A list of tested batteries and suppliers can be found in the appendix. Battery cables and wiring will vary from battery suppliers so make sure that the cable you use is approved for use with the specific battery in use.

The DFR has two Neutrik 'PowerCon' connector for 24V. This allows for battery change over when in the field avoiding power cycles in a long record. Both power connectors can be plugged and unplugged live without any interruptions to the DFR operation.

The DFR features a low voltage sensor on the DC inputs. This shows the user when input power starts to fall off when using batteries. At 21V DC the main LCD and dmagremote report low voltage. The tally light will also pulse and flash rapidly, this feature works in all modes of DFR operation, stop, record or play. The tally lights are lit also regardless of DFR mode, this may prompt the operator to think he is in record mode so the user should get used to the flashing pattern or fast flash, hold light, fast flash. The main LCD display reports low voltage as does the dmagremote. It is strongly recommended that a second power source is plugged in at this time into power socket two. At a nominal 20VDC input the DFR will commence an auto power shutdown to protect the system integrity. The tally light is turned off, the main LCD reports shutdown mode and dmag stopped and the dmagremote reports shutdown mode and then will stop communicating until power is turned on again.

Powering up

The power switch is a momentary toggle, move upwards and release, the red power LED will come on and the system will start its boot up sequence. The main DFR LCD screen shows boot progress.

Power Off

Use the power switch, move upwards and release, this starts the power down sequence. The main DFR LCD screen shows that the DMAG software as stopped. It is not a good idea to just remove power while the DFR is operating without stopping the system first by using the power off toggle switch. However if this does happen the DFR will recover on next boot up. If the DFR is actually recording when power is interrupted then you may lose the take that was recording.

Interface and Control

The DFR is shipped ready to go. A factory default profile is loaded so that if you need to record straight away, all you have to do is install a D.MAG magazine, connect power and turn on, records can be started via the PDA, a camera connection or a GPI connection (standard GPIO style). File formats, video formats, timecode, production records are all automatically created. The user can modify all these records and settings via the PDA or through an Ethernet connection.

Figure 11 Interfaces

The interface and control connectors feature USB, Firewire, Gigabit Ethernet and RS422 for maximum control flexibility. In addition a camera socket, GPI panel or wireless can be specified.

The USB 2.0 port can be used for the iPAQ PDA. When using a PDA the D.MAG remote program requires sole possession of the USB port for control. It is not advised to use a USB hub or share the USB with other devices when the PDA is attached to this port.

The RS422 port can be used with any controller supporting Sony protocol. The protocol is based on BVW75 emulation with extended commands. When executing record commands the DFR will record using the default profiles chosen by the user. If no profile is chosen then the factory set profile is invoked (see profile menu and default menu). The DFR is not intended to be a frame accurate editing device under RS422 control. It will respond to autoedit commands as a player but does not support extended record command and functions.

The Gigabit Ethernet port is provided for connection to an external computer. The host operating software in the DFR allows the D.MAG to be mounted as a network attached device. This port supports control and file transfers. It is provided on the DFR principally to allow the up and download of production information from and to the D.MAG for logging software and shot listing. The Ethernet automatically adjusts to lower bandwidth connections such as 100Mbit and 10Mbit. The iPAQ and LCD screen both will show the Ethernet settings, these can be changed with the iPAQ to be either static IP or using a DHCP auto IP server. The IP address is displayed either way.

A second Gigabit Ethernet connection is supplied. This is normally set for DHCP support. See setting network chapter below for use and set up of the two Ethernet ports.

The camera connection provides full trigger and tally functions and status returns to a camera viewfinder. The tally light on a camera will be lit when the DFR is in record. In addition, the DFR will flash the tally light when the DMAG nears the end of its record time, a slow flash starts at less than 3 minutes, it flashes faster at one minute and very quickly when less than 30 seconds remain. It also flashes when low power is detected on the 24V power input representing low battery warnings. These flashes have a different pattern to the end of media warning. The record LED on the S.two local control panel also follows the tally flash for messages.

When executing record commands the DFR will record using the default profiles chosen by the user. If no profile is chosen then the factory set profile is invoked. (see profile menu and default menu). An optional GPIO connector can be specified, this allows the triggering of records via a standard active GPI. This can be used with external control devices such as remote camera head controllers or foot switches or camera breakout boxes. This connection also includes an RS232 serial control connection for use with the PDA D.MAG remote.

DFR Local Control Panel (LCP)

The DFR LCP provides an easy to use hand remote for basic functions of the DFR.

It is designed to be used in conjunction with the DFR local LCD display and either the PDA or laptop for set up. Once set up, use the LCP and go. The LCP attaches to the DFR via and included cable which has a Screwed on DB9 at the LCP end and a quick release Hirose at the DFR end.

Using the LCP assumes that the DFR is already set up for frame rate, image size, outputs, color space and timecode. These can be set with either the PDA or laptop as normal.

The Rec Enable turns on record enable and puts the DFR into EE, the yellow LED is lit when record is enabled.

A further touch of the REC button will start a record.

The RED LED next to the REC button will light once the DFR is actually recording. If using the camera trigger this will also start a record and the RED LED will light.

In addition, the REC LED also follows the tally light functions provided to the camera with flashing sequences to indicate low battery and end of disk.

The DFR stays in EE rec enable on at the end of a record. To playback the last take just press play and playback will start automatically of the last take. If the DFR is set to LOOP PLAY then this will continue to play until a stop is set. If not set to LOOP then it will stop at the last frame of the take. To watch the take again use the <TAKE key which will put the DFR at the beginning of the take ready for a play. Use the <TAKE to go to previous takes for playback. Use the >TAKE to advance to the next take for playback. Use the REC ENABLE to place the DFR in EE at anytime. A REC will start recording wherever the DFR is but will always append to the end of the last take as usual.

THE DFR settings will stay as lat set through a power up down sequence so that if you hard it set to single link out, LUT on, V Squeeze on it will still be set that way.

Video I/O and Video Sync

The DFR is an uncompressed HD dual link recorder supporting HD RGB. It uses industry standard SMPTE 292M connections with dual link SMPTE 372M (proposed) support for dual link. The DFR is either a dual link or single link recorder with HD RGB and HD YUV respectively. In addition, in dual link mode the unit can be used for HD plus alpha for real time HD YUV and key recording and play out. The DFR is auto sensing on input for video format.

The DFR main video output can also be set to provide dual link to single link color space conversion, this allows users to view HD RGB dual link images on HD SDI monitors that do not have dual link capabilities or for playing into standard HD devices such as a VTR or switcher for test composites. This can be set in the main and output menus on the PDA.

Figure 12 HD Video connections

Output images can be set to a variety of differing standards for monitoring or outputting to other devices. These include HD analog and optional HD down converter.

HD Analog outputs can be sent to either the HD analog component outputs or the SVGA connector. The HD analog outputs can be set to be either HD YUV or HD RGB. The signal has sync on green or sync on Y. The SVGA connector is set to be a standard XGA signal, RGB + H & V sync. These allow users the maximum choice of monitors on allocation including multi-sync computer style monitors or analog input plasma displays.

Figure 14 SD Video connections

The down converter can be configured for SD SDI, SD composite analog or SD component analog. The down converter includes a 3:2 pull down inserter for 24 frame to either 601 SD 30 frame or NTSC composite. The SD SDI can be used to feed an external standard definition recorder such as a Digital Betacam or DVC PRO tape deck. The analog outputs can feed standard tape recording devices including analog Beta SP or VHS decks.

Set up of all the video outputs can be found in the option set up menu and the output menu.

Sync. The DFR is set to auto sync dependant on input. It will always reference to video input in record and EE modes. Reference can be either tri-level HD sync or Bi-level standard mixed syncs including color black, NTSC or PAL.

If there is reference available on the sync input then the unit will find that reference and use that in playback. If there is no reference the unit will stay locked to video input in playback, if there is no input the DFR will free run based upon last known reference available.

The sync provided should be the same as the format used if reference lock is to be maintained. The DFR will follow the sync that is provided for 1000/1001 frame rates such as 23.98, 29.97 etc. In cases where the unit is set to HD 23.98PsF or P, it can reference to NTSC sync or tri-level 59.94i or tri-level 23.98 or bi-level 23.98 (slow PAL) if available. When set to 1080 25P or PsF or 1080 50i the unit can sync from standard PAL color black or tri-level 50Hz.

Sync preferences can be set in the production profiles menu. Choices are auto, input only, external only, internal only. In all cases in record the DFR will use input sync on record. In external the DFR will attempt to sync to external in EE mode but not in record. This is so that timing adjustments may be made to external devices. There are no timing adjustments for the DFR.

Delay through the D.MAG system is set to occur on frame boundaries. The delay time is 2 frames. The DFR also has play delays for edit timing that can be set by the user. This delay is for RS422 commands from edit controllers. This delay can be altered for edit timing when necessary. This is set in the Play Set up menu.

Audio input, output and monitoring.

The DFR system has full support for uncompressed digital audio record, 48kHz, 24 bit. The DFR has 6 channels included as standard with the unit plus full monitoring capabilities. The DFR RGB has 8 channels available as an option. In both cases the connector panel is the same.

The DFR main LCD screen and the PDA initialization screens both indicate if the audio option is fitted and whether it is turned on in the user profile loaded at boot time. The audio is always on. There is no advantage in space to only record two or the 6 or 8 available channels. The user will be able to specify the audio file format in the production profile in later versions.

Figure 15 Audio I/O section

The AES/EBU inputs are 110Ω balanced digital audio. Each 3 pin XLR carries two AES/EBU channels. Although the digital audio should be synchronized with video for the best quality of recording, the DFR audio input circuitry can re-sample non sync audio from 32-96 kHz to provide the best signal possible that is perfectly in sync with video rates.

Figure 16 Audio monitor section

The 3 pin XLR line outputs are analog line driven balanced audio outputs. These are provided to drive line mixers or outboard analog recording devices. In addition, the DFR provides two sets of stereo headphone outputs. Both the headphone and line outputs follow the channel selection provided, this allows selection of each channel individually, each channel pair or all channels mixed together. The level and balance control functions on the two supplied headphone outputs only.

Timecode Connections

The DFR system is provided with analog LTC connections conforming to SMPTE 12M. The analog timecode support is via BNC 75Ω connectors, unbalanced. The LTC input feeds a full internal reader generator with input balancing and amplifiers. The D.MAG generator reshapes and cleans the input LTC signal to make sure that timecode is always good. The timecode generator can be ran in a variety of modes including internal, external, jamsync and free run. The time code can be preset for start code and can be either continuous or RECRUN in operation.

Figure 17 Timecode I/O

The LTC code can be set in the set TC menu.

In addition to LTC, the DFR has full support of embedded timecode conforming to SMPTE RP188 and RP215A. This is often referred to as VITC code or ANC DATA. The DFR will convert LTC to ANC DATA so that video recorded on the DFR will have both LTC and VITC on playback. The ANC DATA space is fully recorded and placed in the file header so that any additional information including metadata can be stored with video files. UMID code can also be recorded via the LTC, Ethernet, RS422, GPI, audio or USB connections. The DFR can record both LTC and VITC if required.

All set up of the timecode is in the scene profiles and the set TC menus so that the timecode requirements can be preset or changed on a shot by shot, scene by scene or reel by reel basis.

Option Panel

The DFR can be ordered with variety of option panels. These panels have the wireless antenna for 802.11b PDA connection, camera and GPIO connections on them. There is also a panel for IEC AC inputs if the DFR is ordered with internal AC power.

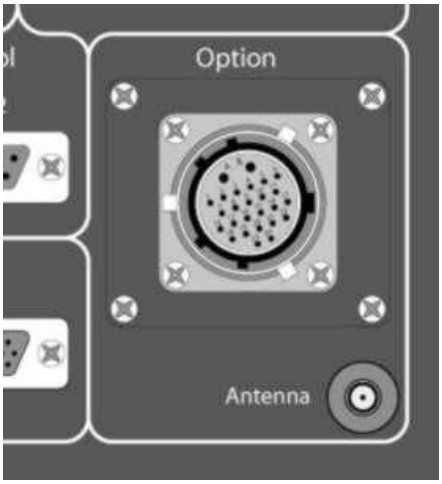


Figure 18 Option panel

The GPIO connections are on a 26-pin socket with a breakout cable. The GPIO can be used for a variety of functions such as triggering of records via a standard close-to-ground GPI. This can be used with external control devices such as remote camera head controllers or foot switches or camera breakout boxes. There are four externally operated General-purpose inputs; these are preset for record start/stop. Cue to last take and play/stop. Still and play reverse. These triggers can be assigned other uses in the PDA option set up menu. The option socket is intended to be a control and tally connection rather than a video interface. When executing record commands the DFR will record using the default profiles chosen by the user. (see profile menu and default menu). The socket also includes an RS232 interface used with the PDA control when not in wireless mode. A breakout GPI/RS232 camera cable is available.

The Antenna connection is an SMA co-ax socket. A right angle small antenna is provided with the wireless option. The antenna screws directly on to the socket; the antenna can be rotated to provide the best reception of signals.

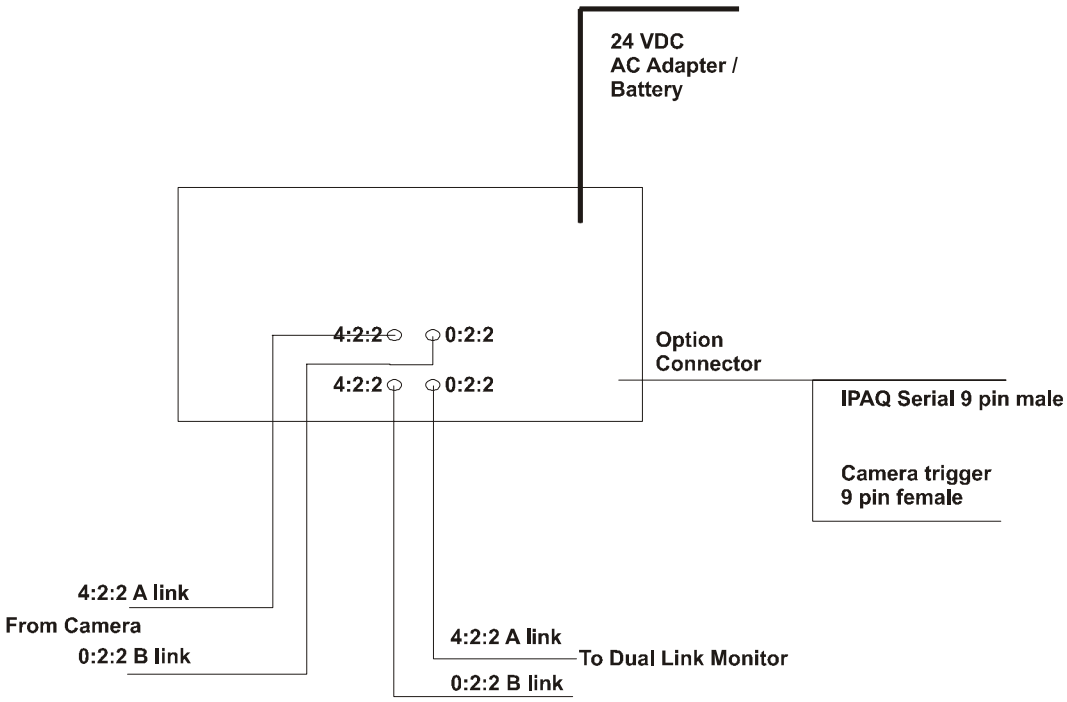
The IEC AC input is universal AC 100~250V AC 50/60Hz. No user switching is required.

Additional option panels will be available over time. All wiring and option specific can be found in the appendices to this manual as well as with each panel. An S.two service agent can supply and change option panels. Please contact your local sales or service agent for details.

Using the DFR

Connecting a DFR

In field records, with trigger / tally and iPAQ.



D.MAG-R Connections

1. **Power to the DFR recorder should be OFF.**
2. **With the recorder standing up and the connector panel facing you, insert a magazine into the receiver with "D.MAG" on the left and "S.two" on the right.**
3. **Slowly push the magazine down into the receiver and tighten the thumbscrews.**
4. **Connect "HD Video In" cables: 4:2:2 (A Link) and 0:2:2 (B Link).**
5. **Connect 26-pin breakout cable connector to the "Option" socket.**
6. **Connect the PDA (if used) to the DB9 male connector on the breakout cable. If using a laptop or computer for control, connect to Eth#1. The IP address is displayed on the main LCD panel on the DFR**
7. **To enable recording from a VTR trigger command from the camera:**
   - **If using a Thomson Viper camera, connect the DB9 female connector on the 26-pin breakout cable to the control port of the Viper breakout box option (LDK 8275).**

- **If using a Sony HDC-F950 camera, connect the supplied DB9-DB25 adapter cable to the DB9 female connector on the 26-pin breakout cable and the DB25 on the HDCU-F950 control unit.**

8. **Connect a 24VDC power source to the 24 Volt main power connector.**
9. **Move the momentary toggle power switch upwards and release it. The red LED will light if the correct power is sensed. The recorder will then begin an initialization sequence and information will be displayed on the unit's primary LCD.**
10. **When the unit is ready an initial timecode of "00:00:00:00" and a transport status of "STOP" will be displayed on the LCD.**

DFR OPERATION WITHOUT THE PDA

1. **Operation without the PDA attached is limited. Timecode is always initialized the reel settings so that reel one has an LTC value stating at 1 hour. Recording can be initiated from the camera via the breakout cables or the LCP. The LCP Rec Enable /EE function allows recording. The "Take" number will be automatically incremented and stored on the D.MAG with the frames comprising it each time the recorder is put into Record after a Stop.**
2. **Defaults**
   Video Format: 1920x1080 23.98 PsF HD RGB Dual Link 10 bit
   File Format: DPX
   Output option: HD SDI Dual Link, Analog HD via 3 BNC's
   The DFR will follow a default initialized to the D.MAG magazine and continue with these settings automatically.

HD-SD Downconverter: 1 Composite & 1 SD SDI output, 3:2 pulldown ON, letterbox 16x9

Using the D.MAG with a Thomson Grass Valley Viper Camera

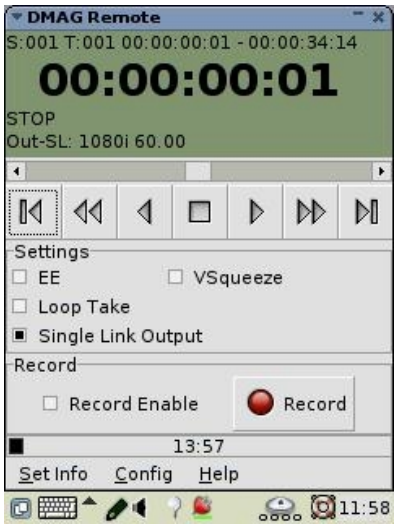
It is recommended to use the BoBOX breakout adapter with a Viper FilmStream camera. This allows the use of camera Triggers and Tally functions. Plug the female 9 pin from the D.MAG option cable into the BoBOX 9 pin socket. It is recommended to make this connection before power is applied to the DFR. Apply power to the camera head first, then the DFR.

The trigger function will operate from the front VTR trigger, the side VTR trigger or if available, the lens VTR trigger buttons. Set up on the Viper is required to make the VTR trigger a latching command rather than a momentary one. The set up is on the Viper main menu under LENS commands. Set the LENS trigger to ALT rather than MOM. Please see the VIPER operational guide on setting this option.

Video from the Viper can be obtained directly from the camera head or from the BoBOX. Connections for video are as described above, A LINK connects to the DFR 4:2:2 IN, B LINK connects to the DFR 0:2:2 IN. In order to use the trigger to start recordings the Record ENABLE must be set on the iPAQ for the DFR.

The trigger function includes full tally response to the camera head. The tally will light the REC light in the viewfinder, the tally lights on the rear of the camera body and the tally light on the front top external of the viewfinder (this light can be turned off, see Viper operational manual). The tally function also includes a record time out warning level. This flashes the tally light when the record time left is running low on the D.MAG. At 3 minutes the light is flashed at medium speed. At less than 1 minute the flash rate is faster. At under 30 seconds the flash rate is very fast. Once the under 30 seconds flash is evident you should stop recording rather than rolling out. The lights will go off completely if you do roll out to indicate that recording has stopped. If the D.MAG rolls out you may lose some frames at the end of the magazine.

DFR OPERATION WITH PDA

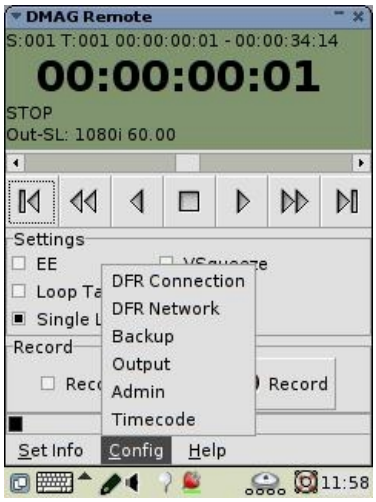


1. **Power ON the iPAQ PDA. Touch the screen to activate the primary display. Use the lower left button to access the DMAG Remote program**
2. **Communications with the PDA are established automatically unless a selection has been previously saved. If there are no communications (a message is displayed in the timecode box) then touch config and DFR CONNECTION. This allows the user to choose the connection path to the DFR. Touch SERIAL PORT and OK.**
3. **The top of the screen shows the timecode position of the DFR, take and scene info of the current scene.**

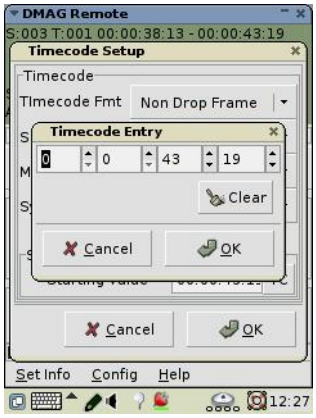
4. **Touch SET INFO and then NEW REEL to start a new reel, NEW REEL will erase any material that may be on a magazine already. A dialog will prompt a choice between continue last scene from previous reel or start a new reel. Continue previous will mean that the next take will be counted as if from the last take of the scene from the previous reel, carrying on Timecode and all other settings. NEW will create new settings including new scene information. Hit OK**

5. **To edit scene information including setting video format and timecode start numbers you can use Edit Scene from the Set Info menu. See User manual for full details.**
6. **Each new RECORD will create a new (Current) Take by incrementing the number from the Last Take. You cannot record if the Record Enable is not set. LCD and the tally's will all show recording status.**

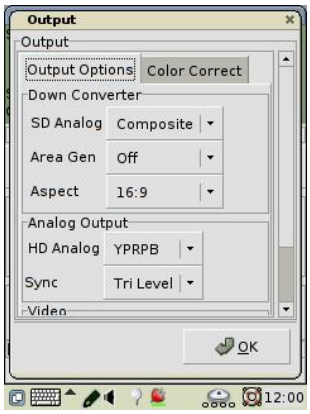
7. **The unit will always start recording at the end of all previously recorded material.**
8. **Touch the RECORD button to begin recording. The large recording message comes up to confirm recording has begun.**
9. **STOP will stop the record. The unit will remain in EE mode. Any play or cue will turn off EE mode.**
10. **PLAY will play back the cued Take. Single Link effects the HD and analog outputs so that the video is either Dual Link 4:4:4 or Single Link 4:2:2 using a high quality program color space conversion. This allows the user to view material on a non-dual link color monitor with integrated full color pictures or to dub to 4:2:2 HD and SD Video Tape recorders in EE, Record and playback. The recorded data is NOT affected.**



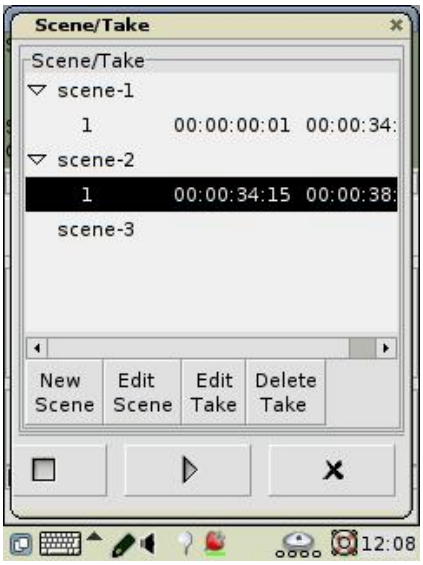
11. **For Loop Mode on playback touch the Loop Take. This will loop the selected take continuously. The Loop will function from the start of the positioned take to the end of the last take in the scene.**
12. **V Squeeze will apply letter box to electronic anamorphic shot material giving a 2.37:1 letter box in HD space.**
13. **The symbols on the end of the cue bar will jog the unit as will dragging the cue bar; > will jog one frame forward. The < will jog one frame backward.**



14. **Timecode can be set up either from the edit scene or set timecode menus. The Set Timecode menu selection can be found in the config menu. The edit scene is in the Set Info / Edit Scene**
15. **The user can set the TC value for any Start time. That value will then ascend with each RECORD.**
16. **Timecode (TC) is fixed to Internal, RECRUN in this version.**
17. **Set TC Start provides four boxes for hour, minute, second and frame. Touch the arrow ∇ next to each box to bring up the choices. Choose the desired numbers for each box and touch SAVE on the screen. The timecode entered is reflected on the PDA screen, the LCD display on the DFR recorder, and is stored on the magazine with the material in DPX file headers and is used in file names. The TC value displayed is always accurate when in STOP or at cue points.**



18. **Touch the Config on the lower menu bar and then Output menu.**
19. **Output menu allows the analog output and down converter selections to be made.**



20. **To edit , delete cue to scene and takes touch the timecode area on the main display. This leads to the scene take display. Touch any scene or take and the DFR will cue there. When parked on a take, Delete Take will erase that take only. Make sure that you want to delete this take - THERE IS NO UNDO FOR DELETE TAKE – A confirmation screen is presented before the take is deleted.**

Dual Camera Recording

An option is available from S.two that allows two DFR recorders to rolled simultaneously from a single control source. This is very useful for 3D or stereo recording from two cameras. This allows both DFR to be controlled from a single IPAQ so playback and all other operational controls act together. This option uses a special cable available from S.two and D. MAG distributors. There are no software of operational setups to use this mode except to make sure that the magazines are matched and that both DFR are the same rev and operational software level. In addition, it is recommended that the magazines are started from a fully erased state with identical NEW REEL or New Production set ups.

You can also run as ganged operation multiple DFR from a single laptop or network host. To do this make sure that the DFR are all connected via a network switch and that the laptop has X Windows software (see Network below). Multiple control windows can be open at the same time, this interface will also operate multiple DFR from a single DMAGREMOTE package. Each DFR will have its own remote display. See Ganged operation below. It may be advantageous to have each camera genlocked in multiple camera operation. Do not apply sync to the DFR.

So Really, How do I use this anyway?

The DFR is designed to be easy and intuitive to use requiring very little to run but providing many additional features should they be required. Operation is the same whether the system is controlled from the PDA or via a laptop (either PC or MAC). Most functions have a level of automation such that the user does not need to actually operate the system to get the shot.

The basic rules for operation are;
Make sure that you have the video input connected as your production requires, in general this means dual link video.
Make sure that the camera is set to the correct frame rate. The DFR main LCD and the dmagremote program both tell the user if there are any issues with the input signal. The auto-sense on the input operates in EE mode and tells you what is actually coming in and whether the dual link signals are timed to each other.
Connect the control surface, either PDA or laptop. See below on connecting a laptop, the programs that need to be present and how to run the dmagremote client.
Operation is the same in either case.
For a new production select new production and hit apply. This will erase any material on the D.MAG magazine, creates a new reel and a new scene and allows you to enter data about the production should you wish to do so, you don't have to, but you can.
Select the scene take list by touching the main timecode display area. Select edit scene, You can name the scene so that it matches the slate or leave it at the default value. The DFR keeps track of all reels, scenes and takes that attach to a production profile so that the user can keep incrementing values automatically.
At the bottom of the menu is the set video format, touch the button at the side of the format and a pop up menu will display the format and give you input choices, select those that you need, the default is 1920 x 1080 10 bit, dual link RGB 23.98 PsF with RGB frames. You can choose HD YUV (single link standard HD), 8 or 10 bit and the frame buffer format.

This allows you to change the color space of the recorded files. So if you want to record standard 10 bit HD into RGB DPX files then the system allows this, also if you want to record RGB data as standard YUV files this can also be done. The input video format is always displayed in EE and record modes, the output settings are displayed in play back modes. They may not always be the same.

Hit OK and then next page, here you will find the timecode settings which allow the user to select the timecode source, personality and set start timecode values. The timecode can be changed on a reel or scene basis. The default is Internal, rec run. This timecode always follows the frame rate of the input video selection. The timecode is recorded in the DPX file header and also forms part of the file name. It is played out with material as RP188 ANC data in the video stream, as analog LTC from the LTC output and via the RS422 control.
With this, you are ready to go!
On the main menu, select EE and record enable, if you have a single link monitor or are using SD or analog HD monitoring select single link also, this will give you a full color integrated monitoring output in EE, record and playback.
Touching the record button or the camera VTR start button will start a record. There is a large pop up window which tells you this, the main LCD screen on the DFR also echoes status.

Yes but it doesn't actually record?

There are two main reasons why a record would not start;

1. **The record enable is not set**
2. **The input video is missing or does not match the setting in the scene menu.**

In either case the DFR and Dmagremote tells you this. Watch for messages in the timecode display area on the dmagremote program or on the main DFR LCD screen.
It is also possible that the magazine is full, if you have executed a new reel, this will automatically erase the magazine so it is unlikely that this is the case.
If using the system on batteries, the battery may be low, the DFR will also indicate if this is the case.

So to summarize:

1. **install magazine**
2. **connect video, power and control,**
3. **Turn on rec enable and shoot!**

Changing magazines

Changing magazines in the field can be done without requiring a power cycle.
Select the admin menu from the config menu on the lower toolbar menus found on most screens.
Select change D.MAG, wait for a message that says it is safe to remove the magazine (takes a few seconds).
Remove magazine, and place a new one in the receiver, the D.MAG will automatically see the new one. Touch LOAD DMAG command, the new reel will start up.
We recommend using the new reel command, if continuing from the last magazine you can choose continue from last, this will carry over all the info from the last magazine and continue the take numbers and timecode from the last recorded take on the previous magazine.
Select Rec Enable and shoot some more!

See below for suggestions on offloading D.MAG magazines from the DFR or via docking stations.

Section Two – D.MAG Data

D.MAG Digital Magazine.

D.MAG System Data Structure

The D.MAG system is organized as a computer style file system with directories and file types that can be mounted and read in other computer environments. Following a simple data structure the D.MAG allows a user to be able to browse image files without having to load each one.

The D.MAG has a simple profile that contains information about the production so the user can find out which take or image he may need to go to. This greatly helps in accessing the materials required without ingesting everything. In addition, the D.MAG has a 'circle take' take marking system. This allows the user to mark known good takes at the time of recording (and any time afterward) much as you would mark a camera report sheet for print take or a production log.

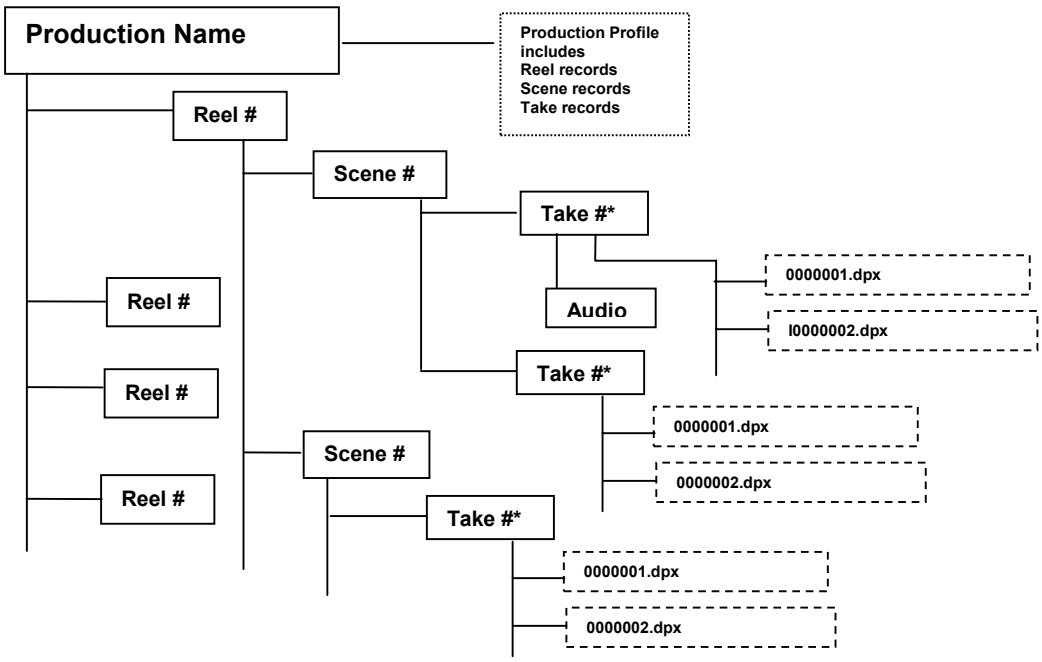


Figure 19 D.MAG File Hierarchy

D.Mag Info file.

Each D.MAG magazine carries a dmaginfo.txt file. This file has all the production, reel, scene and take info. The file can be exported to any PC capable of reading a simple ASCII comma delineated text file. Below is a sample taken from a recorded magazine. This file can be found at /mnt/dmag on the DFR. A copy is maintained on the DFR on its own internal drive so that non-changing information such as production profile and some reel and scene information can be carried over to each new magazine when first installed in the DFR.

The DFR uses the info file to set the video parameters for the scene and also to keep track of the takes, timecode and many other pieces of data that it requires for playback. This file can be edited in place using a data editing program called VI. For information on using VI to edit text when logged into the system use the command 'man vi' or type in 'vi : help'. The user is cautioned that this file should not be edited by the user unless under instruction by S.two service.

The dmaginfo file is a valuable resource when tracking data in post. Much of the information contained in the dmaginfo.txt file is also in each individual frames header file meaning that individual frames can always be reconciled to a take, scene and reel location.

DMAGINFO.TXT

```
[PRODUCTION:0]
    ProdName=none
    ProdDate=0/0/0000
    ProdDirector=none
    ProdDp=none
    ProdOperator=none
    ProdUser1=none:none
    ProdUser2=none:none
    ProdUser3=none:none
    ProdUser4=none:none
    [REEL:1]
        ReelNumber=1
        ReelDate=1/13/2004
        ReelDirector=none
        ReelDP=none
        ReelAssistant=none
        ReelOperator=none
        ReelUser1=User1:none
        ReelUser2=User2:none
        ReelUser3=User3:none
        ReelUser4=User4:none
        ReelLastScene=2
        ReelFileSystem=LINUX_XFS
        ReelFileFormat=DPX
        [SCENE:1]
            SceneNumber=1
            SceneDate=11/3/2003
```

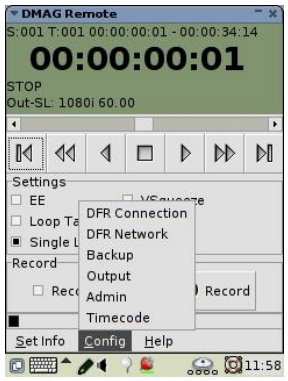
```
SceneTimecodeStart=00:22:03:14
SceneLocation=Not specified
SceneUnit=Not specified
SceneAudioChannels=None
SceneAudioType=Not Specified
SceneVideoFormat=1080psf_2398
SceneVideoSampleRate=RGB
SceneVideoBits=10
SceneVideoFrameBuffer=RGB
SceneTimecodeFormat=LTC_NDF
SceneTimecodeSource=INTERNAL
SceneTimecodeMode=RECORD_RUN
SceneTimecodeSync=SET_START
SceneFieldFrameFlag=Not Specified
SceneCameraType=VIPER
SceneCameraNumber=A
SceneNumberOfTakes=38
SceneLastTake=44
SceneNotes="None"
[TAKE:41]
    TakeNumber=41
    TakeNotes="None"
    TakeTimecodeStart=00:21:20:05
    TakeTimecodeEnd=00:21:30:04
    TakeUserBits=00:00:00:00
    TakeAltTimecodeEnd=00:00:00:00
    TakeUMID=0
    TakeCircle=0
    TakeNumberOfFrames=240
[/TAKE]
[TAKE:42]
    TakeNumber=42
    TakeNotes="None"
    TakeTimecodeStart=00:21:30:05
    TakeTimecodeEnd=00:21:45:12
    TakeUserBits=00:00:00:00
    TakeAltTimecodeEnd=00:00:00:00
    TakeUMID=0
    TakeCircle=0
    TakeNumberOfFrames=368
[/TAKE]
[TAKE:43]
    TakeNumber=43
    TakeNotes="None"
    TakeTimecodeStart=00:21:45:13
    TakeTimecodeEnd=00:21:59:17
    TakeUserBits=00:00:00:00
    TakeAltTimecodeEnd=00:00:00:00
    TakeUMID=0
    TakeCircle=0
    TakeNumberOfFrames=341
[/TAKE]
[TAKE:44]
    TakeNumber=44
    TakeNotes="None"
    TakeTimecodeStart=00:21:59:18
    TakeTimecodeEnd=00:22:03:14
```

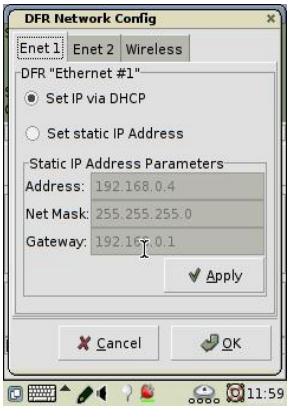
```
                TakeUserBits=00:00:00:00
                TakeAltTimecodeEnd=00:00:00:00
                TakeUMID=0
                TakeCircle=0
                TakeNumberOfFrames=93
            [/TAKE]
        [/SCENE]
        [SCENE:2]
            SceneNumber=scene-2
            SceneDate=1/25/2004
            SceneTimecodeStart=00:22:14:17
            SceneLocation=Not specified
            SceneUnit=Not specified
            SceneAudioChannels=None
            SceneAudioType=Not Specified
            SceneVideoFormat=1080psf_2398
            SceneVideoSampleRate=RGB
            SceneVideoBits=10
            SceneVideoFrameBuffer=RGB
            SceneTimecodeFormat=LTC_NDF
            SceneTimecodeSource=INTERNAL
            SceneTimecodeMode=RECORD_RUN
            SceneTimecodeSync=SET_START
            SceneFieldFrameFlag=Not Specified
            SceneCameraType=VIPER
            SceneCameraNumber=A
            SceneNumberOfTakes=2
            SceneLastTake=2
            SceneNotes="None"
            [TAKE:1]
                TakeNumber=1
                TakeNotes=1
                TakeTimecodeStart=00:22:03:15
                TakeTimecodeEnd=00:22:08:12
                TakeUserBits=00:00:00:00
                TakeAltTimecodeEnd=00:00:00:00
                TakeUMID=0
                TakeCircle=0
                TakeNumberOfFrames=118
            [/TAKE]
            [TAKE:2]
                TakeNumber=2
                TakeNotes="None"
                TakeTimecodeStart=00:22:08:13
                TakeTimecodeEnd=00:22:14:17
                TakeUserBits=00:00:00:00
                TakeAltTimecodeEnd=00:00:00:00
                TakeUMID=0
                TakeCircle=0
                TakeNumberOfFrames=149
            [/TAKE]
        [/SCENE]
    [/REEL]
[/PRODUCTION]
```

Using the Network Connection

The DFR is equipped with a dual Gigabit Ethernet connection. Use of these connections allow up/downloading of D.MAG images, viewing and downloading of the DMAGINFO file, erasing D.MAG magazines and updating D.MAG operating software. The connection can also be used for control using the dmagremote program which features the same functionality as the iPAQ dmagremote program allowing a remote user complete control over the DFR.

The DFR is supplied with factory default connection settings, one port being set to a static IP address and the other set to DHCP mode. The user can configure the ports via the IPAQ or the DMAGremote. In addition you can log in via the network port and configure via ssh commands. The static address value is displayed on the main DFR LCD when the DFR is in stop mode.





Default static address IP Address Eth#1 - 192.168.0.52

The connection can be changed using the iPAQ network menu described in the network menu chapter. A user can choose between Static and DHCP. DHCP is an automatic self configuring network connection. When in DHCP mode the IP address is displayed on the main LCD and the iPAQ network settings menu. When the second optional Gigabit port is connected, this is usually configured in DHCP mode. To find out the DHCP address use either the iPAQ or ask the static IP Ethernet port using an SSH or X-windows connection. Both ports can operate concurrently to give double bandwidth transfers or have simultaneous users (NOTE: Do not have both ports on the same network as there can be confusion and collisions under this circumstance. If you need to have both addresses sharing the network contact S.two service and support.).

The DHCP client will not be turned on if a DHCP server is not connected during power up. To use DHCP a DHCP server will need to be the connected network during power up.
Standard Linux commands are supported on login. To find the port addresses the ifconfig command is used. See appendix for some useful shell command line instructions including SSH and SCP.
The DFR runs a 'Unix' style operating system and uses command line for instructions and copying. Currently, a telnet/ssh client program that communicates using SSH protocol is required to issue instructions, uploads to the DFR require an SCP program.
The DFR can be mounted to a network using a Unix mount point if required. This allows batch file downloading of takes and scenes.

Using the Network Connection

The DFR is equipped with a dual Gigabit Ethernet connection. Use of these connections allow up/downloading of D.MAG images, viewing and downloading of the DMAGINFO file, erasing D.MAG magazines and updating D.MAG operating software.

The DFR is supplied with factory default connection settings, one port being set to a static IP address and the other set to DHCP mode. Default static address IP Address Eth#1 - 192.168.0.52 . These values can be changed once logged in using ifconfig commands common in Linux. For guidance on use of ifconfig, once logged in type in < man ifconfig > and the software will list general usage and commands.

A user can choose between Static and DHCP. DHCP is an automatic self configuring network connection. When the second Gigabit port is connected, this is usually configured in DHCP mode. To find out the DHCP address use the static IP Ethernet port using a SSH or X-windows connection. Both ports can operate concurrently to give double bandwidth transfers or have simultaneous users (NOTE: Do not have both ports on the same network as there can be confusion and collisions under this circumstance. If you need to have both addresses sharing the network contact S.two service and support.).

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The DFR runs a 'Unix' style operating system and uses command line for instructions and copying. Currently, a telnet/ssh client program that communicates using SSH protocol is required to issue instructions, uploads to the DFR require an SCP program.
The DFR can be mounted to a network using NFS mount. This allows batch file downloading of takes and scenes.

SSH and SCP copy and control via networks

There are several available tested programs for DFR communication and file transfer for both windows and mac operating systems. We describe using two below, one called putty which provides a very simple ssh and scp implementation and a second called CYGWIN which has ssh, scp and Xwindows. Both are shareware. Cygwin is provided by the XFREE organization which is an open source initiative for Linux and BSD Unix operating system access to other computer users.

Setting a windows PC network interface

To log into the DFR, the computer that is going to be used has to be set to be on the same network standard as the settings on the DFR. These connection settings in win XP can be checked in Network connections.

Click properties on either the Network Bridge if available or Local area connection. Select internet protocol TCP/IP and click on properties, if using DHCP click on the button OBTAIN AN IP ADRESS AUTOMATICALLY and click OK. You may need to restart the PC on some versions of windows.

To use the default static IP you have to set the IP address , subnet mask and default gateway on the attached computer. For the default DFR settings the following can be used; IP address 192.168.0 10 (you can use any numbers in the last numeric field that don't conflict with other users on a network. If using a direct connect any number except the default and that the DFR is set to are OK).

Subnet mask 255.255.255.0 (this will auto fill in)

Default Gateway is 192.168.0.01

Click OK, again you may have to reboot your PC.
Once this is set up you can use PuTTY or cygwin to communicate to the DFR.

PuTTY uses windows XP OS and is available for download from the web at http://www.puttyssh.org/. This site includes access to and lists of international mirror sites. This program includes both SSH and SCP programs. (PuTTY is copyright 1997-2002 Simon Tatham. Portions copyright Robert de Bath, Joris van Rantwijk, Delian Delchev, Andreas Schultz, Jeroen Massar, Wez Furlong, Nicolas Barry, Justin Bradford, and CORE SDI S.A.).

Open PuTTY, the putty configuration screen appears. Enter the host IP address which is the address of the DFR 192.168.0.52. Click on the SSH button below the address line, hit open , this brings up a command line shell which shows a login prompt from the DFR.

Login as root by typing root and hit enter.

The prompt will ask for a login password, default system password is **dmaguser**. Hit enter.

To completely erase the DMAG magazine make sure that you are in the /home/dmag directory. A program called ERASEMAG can be ran. To run this program type **./erasedmag** and hit return. This is an irrevocable step so be very sure that you want to do this. Once committed, the screen will show a scroll of executing program lines and finish with a command prompt. This action halts the D.MAG program, the DFR has to be rebooted, this can be done with a power cycle or by typing reboot at the command prompt. Erasing magazines can be done using the main dmag interfaces on the pda or the dmagremote program. Magazines cannot be erased if any user is logged into a directory or there is an NFS mount point still active.

Downloading material from the D.MAG can be done with either the SCP program in Putty or by mounting the DFR within a server environment using NFS. The directory structure of materials on the magazine allow the user to browse the takes on the magazine. If mounted the user can select whole scenes, takes or frame ranges. In order to see the files recorded on the D.MAG, the user should login again as described above. Once logged in to root, change directory to **/mnt/dmag/** and then list the scenes by typing in ls. To move into a scene directory type cd scene_001 or whatever scene name is listed.

To see a list of takes use the command LS. This will list in the shell all the recorded takes. At the directory /mnt/dmag0 can also be found the dmaginfo.txt file which can be viewed with a simple text viewer such as MS notepad. This file contains information about the production, reel info, scene info metadata and take lists with timecode and frame counts for each take.

Viewing DPX files

There are many viewing and graphics programs that can view, use or convert SMPTE standard dpx images.

Xnview have a free viewer available for windows, Linux and BSD platforms, available from http://www.xnview.com/

GraphicConverter is available for MAC OS from http:\\www.lemkesoft.com with support from at least V4.4 and MAC OS 8.x onward.

Both programs have been tested with S.two DPX files.

In addition, the SMPTE standard DPX files created by S.two D.MAG system are compatible with and can be used in a multiple variety of image, graphics and film applications.

Xnview is also loaded onto the DFR and can be used when logged into the system either over the network or when using a direct keyboard and VGA monitor. In either case an Xwindows environment is required. When using the direct system, start the x windows server by typing startx at the log in prompt, which will give a Linux GUI from where you can run Xnview. When logged over the network, use an Xwindows interface as described below. At the log in point start xnview by typing in ./xnveiw an then use the normal xnview controls.

Accessing files

The DFR is a Linux server running Red Hat operating system. How files are downloaded from the DFR depends on the network environment that the DFR is on. Files are saved as standard DPX images using a directory structure.
The D.MAG magazines are mounted drive arrays.
The mount point is:
/mnt/dmag
An ftp server is available for file transfers. Samba may be configured by a system administrator for drag and drop file transfers in windows networks. A drag and drop SSH client is available from www.ssh.com.

X Windows Interface

The programs we have tried are listed below:

Windows XP – CygwinX for Windows, available from http://xfree86.cygwin.com/ Tested on Windows XP Pro and XP Home editions. Versions are available for windows 2000 and NT releases.

MAC OSX has SCP and SSH support built in to the operating system so you only need an X11 Xwindows server to run the DMAGremote program.
Mac OS X XFree86 version 4.3.0 for Darwin available from http://www.xfree86.org/
Tested on OSX 10.2.8 – Jaguar OS.X requires that a version of Darwin is already loaded in order to run successfully. The version we have used was found at:
http://prdownloads.sourceforge.net/xonx/XFree86_4.3.0.dmg?download

With X windows servers, make sure that you have SSH modules with the download.

NFS
If in a normal Linux or Unix environment the DFR supports NFS mounting and file transfers. NFS mounting is a system admin task and is invoked using normal Linux red hat commands.

Windows / MAC OSX

The Cygwin commands and windows work the same way in PC and MAC. Once the initial terminal window is opened on a Mac the rest of the following instructions are valid.

To achieve a transfer a command line interface is required (until an ftp server is turned on). Currently a ssh/scp program is required for downloaded files from the DFR. A tested program for this is Cygwin in PC, standard with OSX..

To find out what is on the dmag use ssh to do a directory listing on the DFR. In the cygwin window, log in using ssh - type

ssh root@192.168.0.52

The system asks for a password, which is dmaguser

A log in cursor appears, type

cd /mnt/dmag

then type ls

a directory listing will appear showing the scenes on the dmag.

To access a scene type

cd scene_001

then type ls again, this lists all the takes

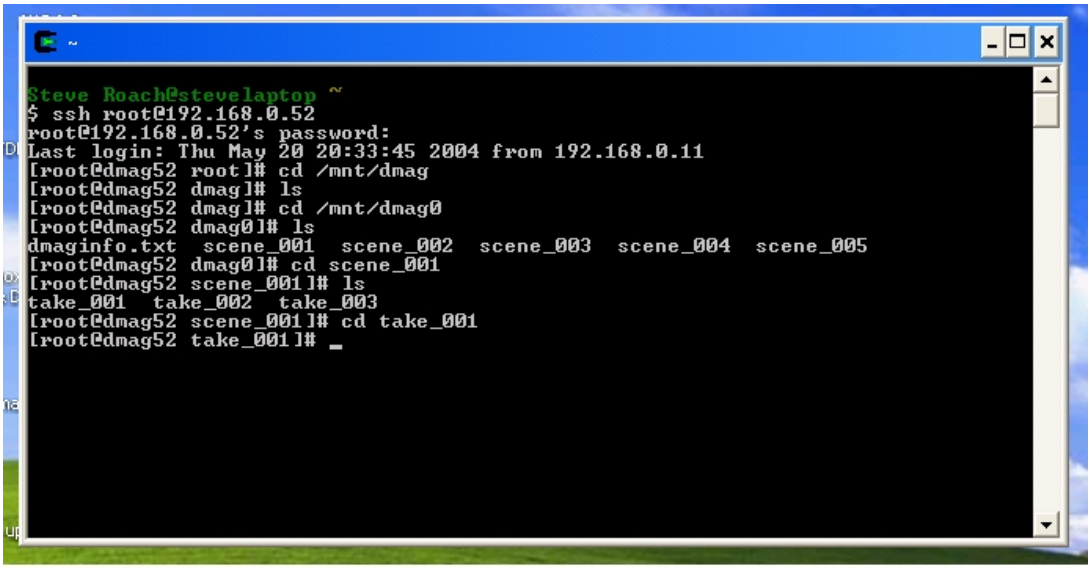
to access a take type

cd take_001

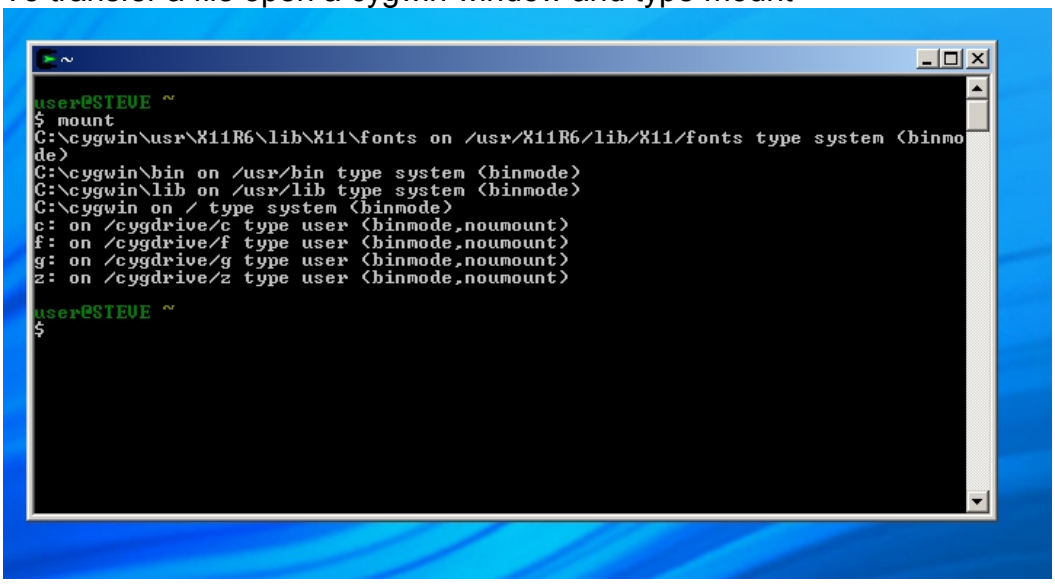
then type ls again an this will list all the dpx files.

To return to the previous directory type

cd ..



To transfer a file open a cygwin window and type mount



This mounts local drives to the Xwindows environment for ease of access when using scp command lines.

In this example we are transferring files to the C drive on a laptop and a directory called dmagimages. If using an external drive such as a firewire or usb drive, it will be mounted as an additional drive letter such as E.

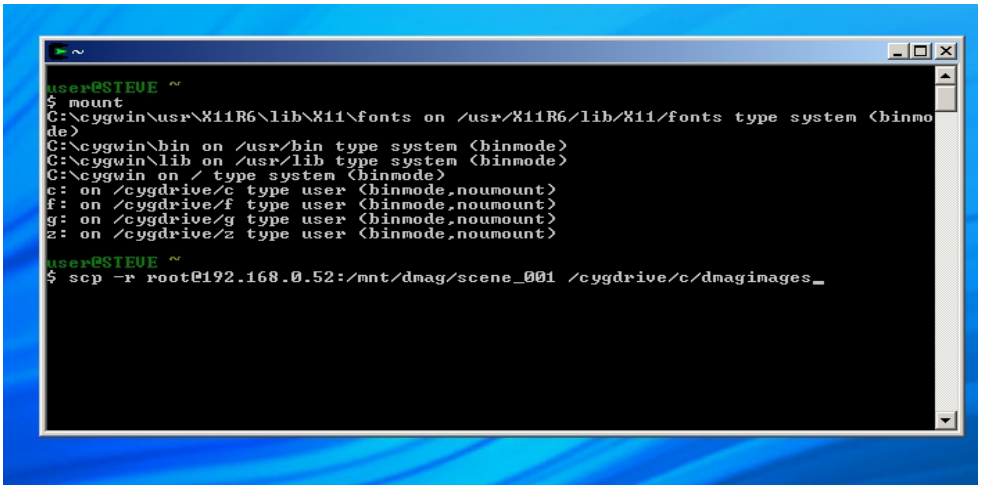
When copying multiple takes or scenes it is easier to keep the scene / take directory structure so that frames can be related back to timecode.

To copy a scene with all the takes folders intact:

Type:

scp –r root@192.168.0.52:/mnt/dmag/scene_001 /cygwin/c/dmagimages

The software asks for a password which is dmaguser and then starts the copy and displays progress. The local drive will have the same directory structure so when you explore the folder dmagimages it will show a folder called scene_001 in which there are folders with each take in which are the individual frames.



To copy individual takes:
Type:

scp –r root@192.168.0.52:/mnt/dmag/scene_001/take_001 /cygwin/c/dmagimages

The software asks for a password which is dmaguser and then starts the copy and displays progress. A folder called take_001 will appear in dmagimages on the local drive.

A range of takes can be done using the same line with a range command on the source side
scp –r root@192.168.0.52:/mnt/dmag/scene_001/take_00[1-9] /cygwin/c/dmagimages

Note that brackets are the square type. The range is set in the last unit so if copyin takes 20 –29 the line would end with take_02[0-9]

To copy an individual frame type
Type:

scp –r root@192.168.0.52:/mnt/dmag/scene_001/take_001/
r001_s001_camA_t001_0021966.dpx /cygwin/c/dmagimages

The software asks for a password which is dmaguser and then starts the copy and displays progress. The frame name contains the reel number, scene number, take number, camera ID and a 7 digit number plus the extension. The name is automatically created when the frame is written on the DFR. The 7 digit frame number is based upon the timecode for the frame. To find the timecode use the method described below.

Using Putty to transfer files

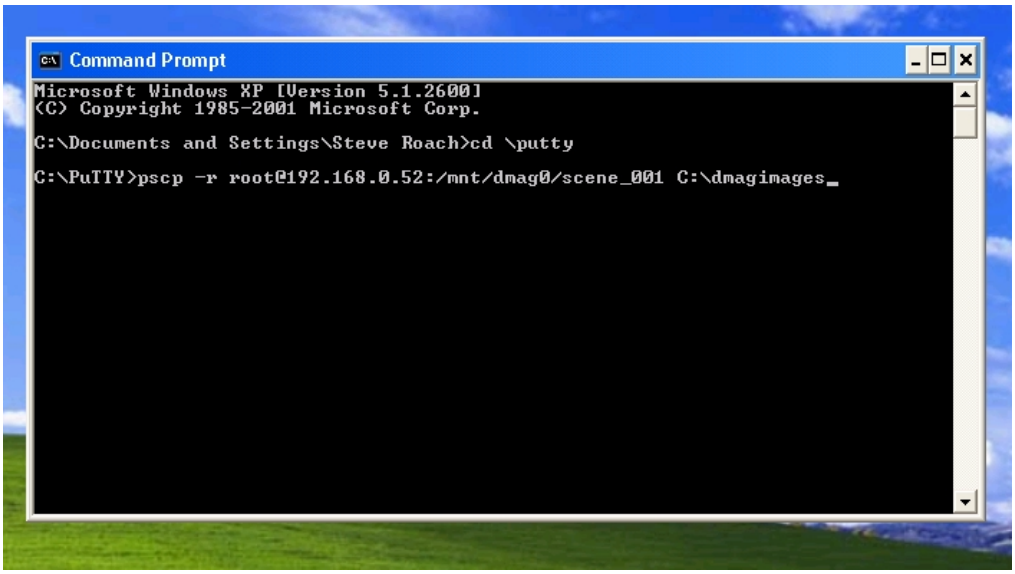
In a windows environment an SSH/SCP program called Putty is available which allows command line transfers to happen without an Xwindows interface. To use the transfer capability it is necessary to open a DOS command line shell using the C prompt program in windows XP under programs – accessories – command prompt. When this is opened a window appears.

The user has to change directories so that they are in the putty directory, in windows type in cd \putty then enter, this changes the directory to putty and the command prompt echoes this. To transfer files using the same example as above type in the line

pscp –r root@192.168.0.52:/mnt/dmag/scene_001/take_001 c:\dmagimages

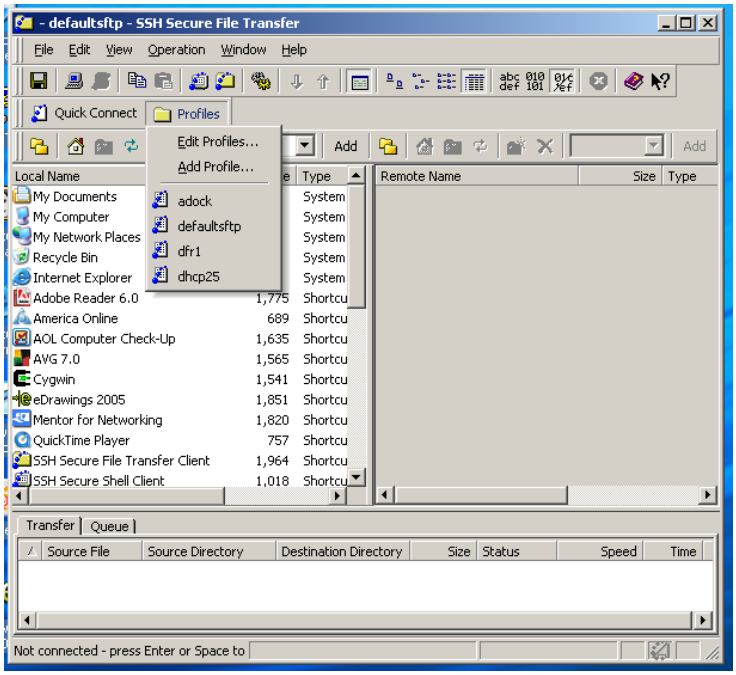
The only difference between cygwin and putty is that putty is a DOS based program so uses DOS commands for directory structures. The SCP command used has a P in front of it for pscp and the mount step is not needed. Putty is an extremely reliable way to transfer large amounts of data. Ranges are not allowed in Putty however so it is more useful for complete takes or scenes or individual frames.

Multiple command line windows can be opened for parallel transfers of multiple items however.



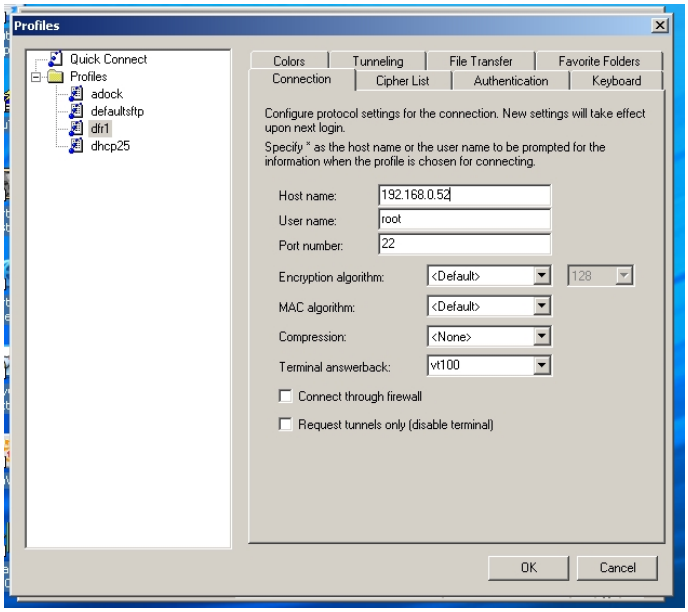
Using SSH Secure File Transfer Client to transfer files

A Windows drag and drop ssh file transfer client is available at http://www.ssh.com/ This allows the user to configure SSH clients for browsing and transferring files to and from D.MAG system products. SSH Secure Shell 3.2.9 Copyright (c) 2000-2003 SSH Communications Security Corp. This software is an evaluation version and needs to be purchased to use in production.



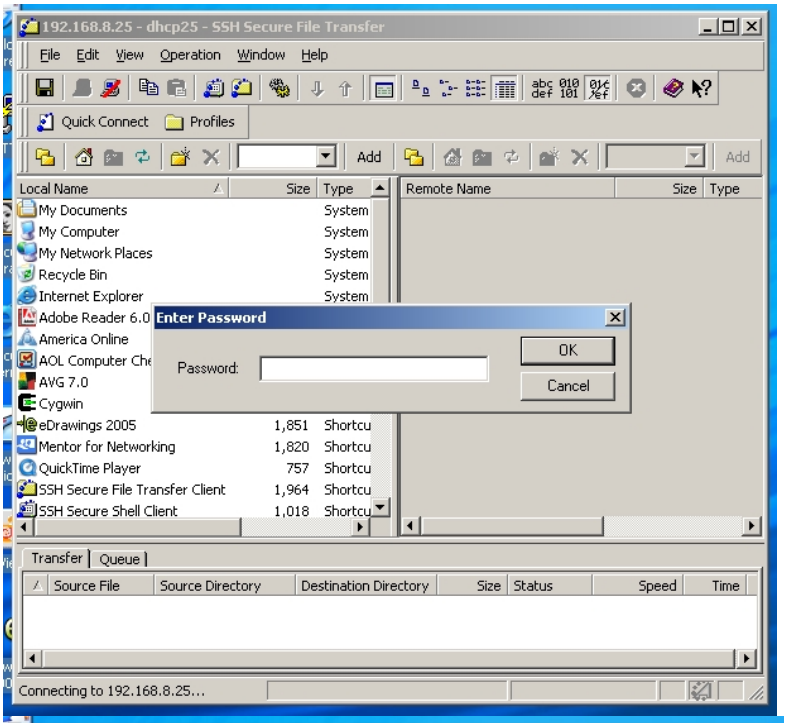
SSH window.

Open the SSH Secure File Transfer Client and select profiles, If first time connecting choose add profile, name the profile in the box when prompted and close. Use a name that says what the device is, when using multiple units with different IP addresses reference that in the name to help keep track of what machine is where. In this example I have a DFR1 and an ADOCK and then a DHCP25 address also. Once the name is entered you then have to edit the profile for correct addresses.

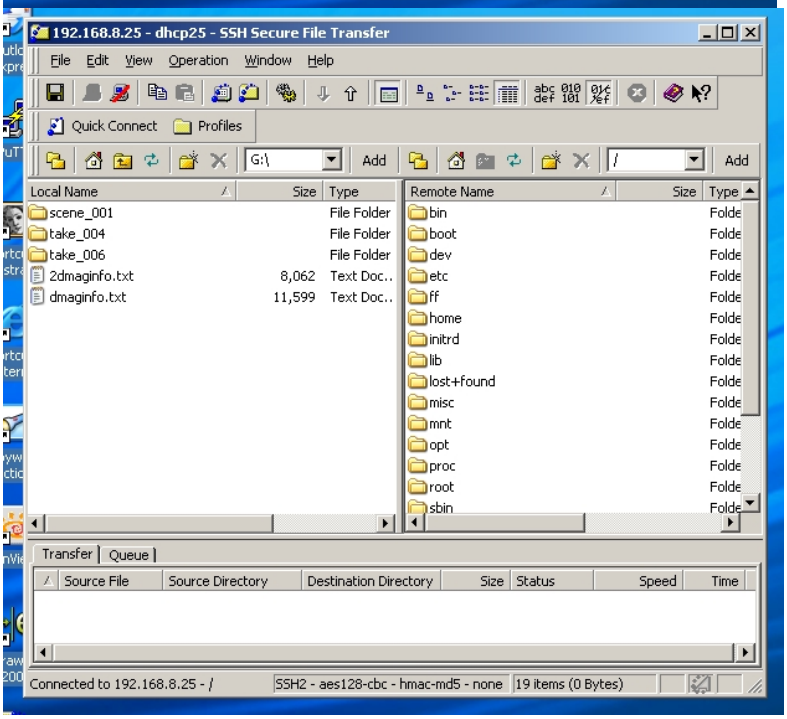


In the edit profile window, enter the IP address of the DFR or Docking station in the Host name window. In user name enter root as that will be the log in user. The rest will fill in on its own and does not need to be changed.

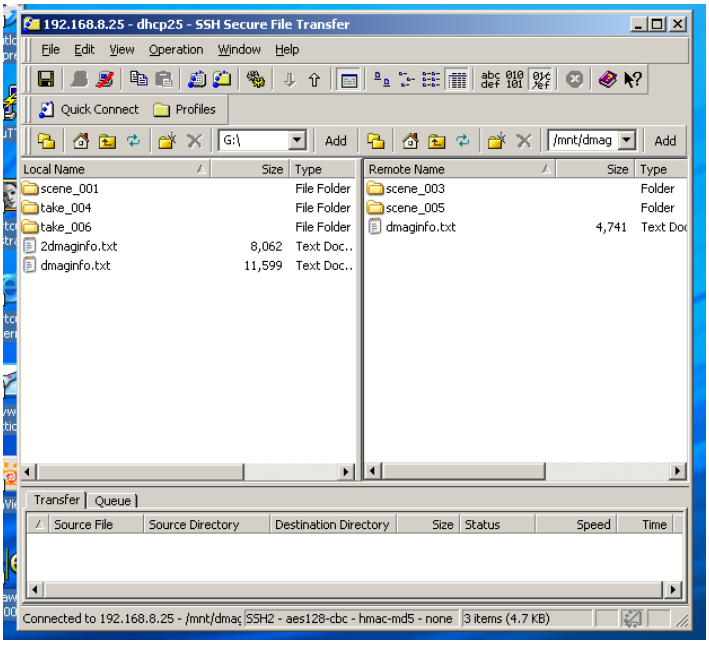
Click OK when done.



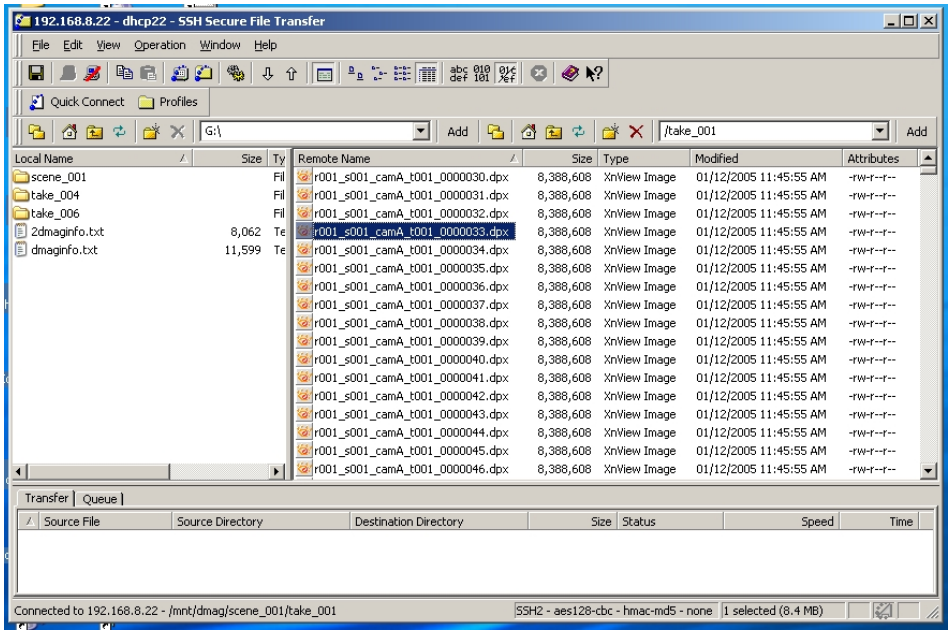
To connect click profile and choose the name of the device. The connection is made and the enter password prompt comes up, the password is dmaguser.



The connection will show the local folders and the remote folders. The root login takes you to the root directory, use the up one folder to go to general directory list on the remote side. Choose the mnt folder and then dmag folder.



You can navigate either side as you would any windows explorer program. To transfer a complete scene, just drag and drop, to get to the takes click on the scene, to see the dmaginfo.txt file just click it and it will open and list everything on the D.MAG and its location, timecodes etc.



The window is resizable so you can see all the attributes of a file. This is a listing of the frames in scene_005 / take_001. The frame names are shown along with size, dates and times created.

Use the timecode calculator to relate specific timecodes and frame numbers.

Running Without a PDA

The DFR can be operated without a PDA or Laptop running DMAGremote attached. When no remote is found the D.MAG assumes a profile and a set of default hardware set ups. These can be preset by the user. The profile assumed will be the last one used or will follow the settings of the D.MAG magazine. The D.MAG loaded is assumed to be empty, ready to record. If partially used the record will start from after the last recording. The profile invoked will be the one with the D.MAG.

The Hardware will be set the same as before. Records can be started from a camera trigger, the S.two Local Control Panel or via an RS422 controller. The stop will function as stop EE so that at the end of a record the unit will pass input video. Other functions will be set as the default unless invoked in the production profile used. The main LCD screen on the DFR will reflect all status and changes in status of the unit. Timecode is displayed in the main LCD.

The D.MAG magazine LCD screen will be downloaded with the default information.

The timecode will also be invoked as per the last user setting or the profile invoked. Jamsync, external timecode REC RUN is the default setting if not choice has been made.

It is also possible to run with control from an attached personal computer via the Gigabit Ethernet connection.

Section Three – DMAGRemote

Introduction

The main control and set up of the DFR is via the DMAG-remote program loaded as the default application on the PDA. It is not recommended to use the PDA for other programs or uses. DMAGremote can also be ran from any network device with an X-windows interface or from a terminal with x-windows support. Under all cases it operates in the same way.

PDA

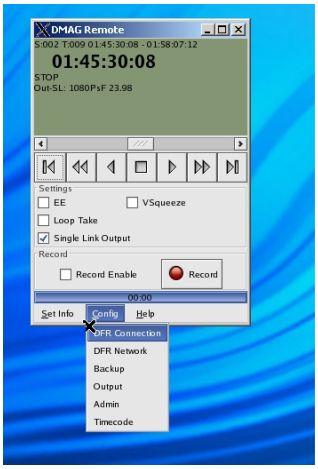
The PDA is pre-loaded with Linux OS for ARM and the DMAGREMOTE program. The remote program is invoked from the lower left hand hard key.

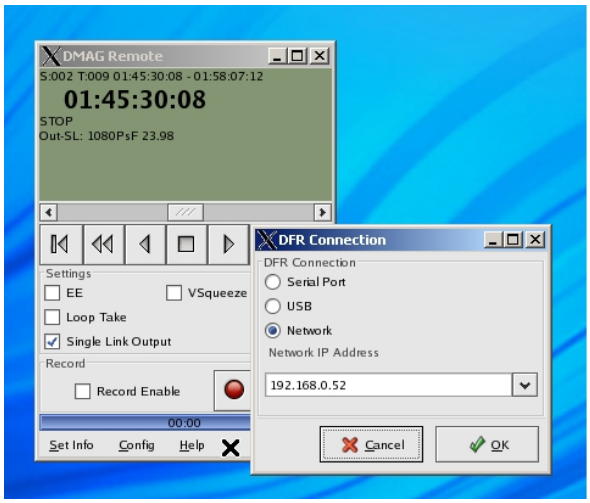
The program has many artificial intelligence steps within it that auto fill in and prompts the user to help save time and interactivity when starting a project or just changing reels. The intent is to combine the camera report sheet and film loading into a single easy step. The D.MAG is easier to load and change than a film magazine and has more data capabilities than a tape.

The production profiles are up and downloaded to the DFR each time a new connection is made. This allows a user to create new profiles offline for use in a shoot.

The main interface for the PDA is the stylus (supplied). The PDA is a touch screen and inputting data and choosing menu selection is done in this way. For this manual we are using the keyboard mode of entry for text inputting. The keyboard can be invoked by touching the stylus to the keyboard symbol in the lower menu bar. Text is entered whenever a cursor appears in a dialog entry box. The keyboard can be put away by touching the keyboard symbol again.

The PDA can be connected via serial or USB to a DFR. When using USB connections via a flying lead the PDA will also take power via the USB. Do not have serial and USB connected at the same time.





When connecting via USB the PDA is actually using a network protocol. The main screen will show “no comms” under the timecode area. To make a connection select the CONFIG menu and touch DFR CONNECTIONS. Select network (NOT USB!). Make sure that the network address shown is 192.168.8.1. (this is the address of the DFR in the USB network). Press OK.

Otherwise, Press serial if using the serial connection and OK.

In all other senses the PDA works the same as the remote PC version of DMAGREMOTE.

PC/ Mac /Linux

To use the dmagremote program with either MAC or PC platforms it is necessary to have an Xwindows program as described in the network section, Xwindows.

Start the X windows manager which in windows XP is called cygwin.

Type startxwin.sh at the prompt. This calls up a tested windows manager that allows for use of the dmag remote program.

The new window opens, make sure that it is active by clicking on it with a mouse.

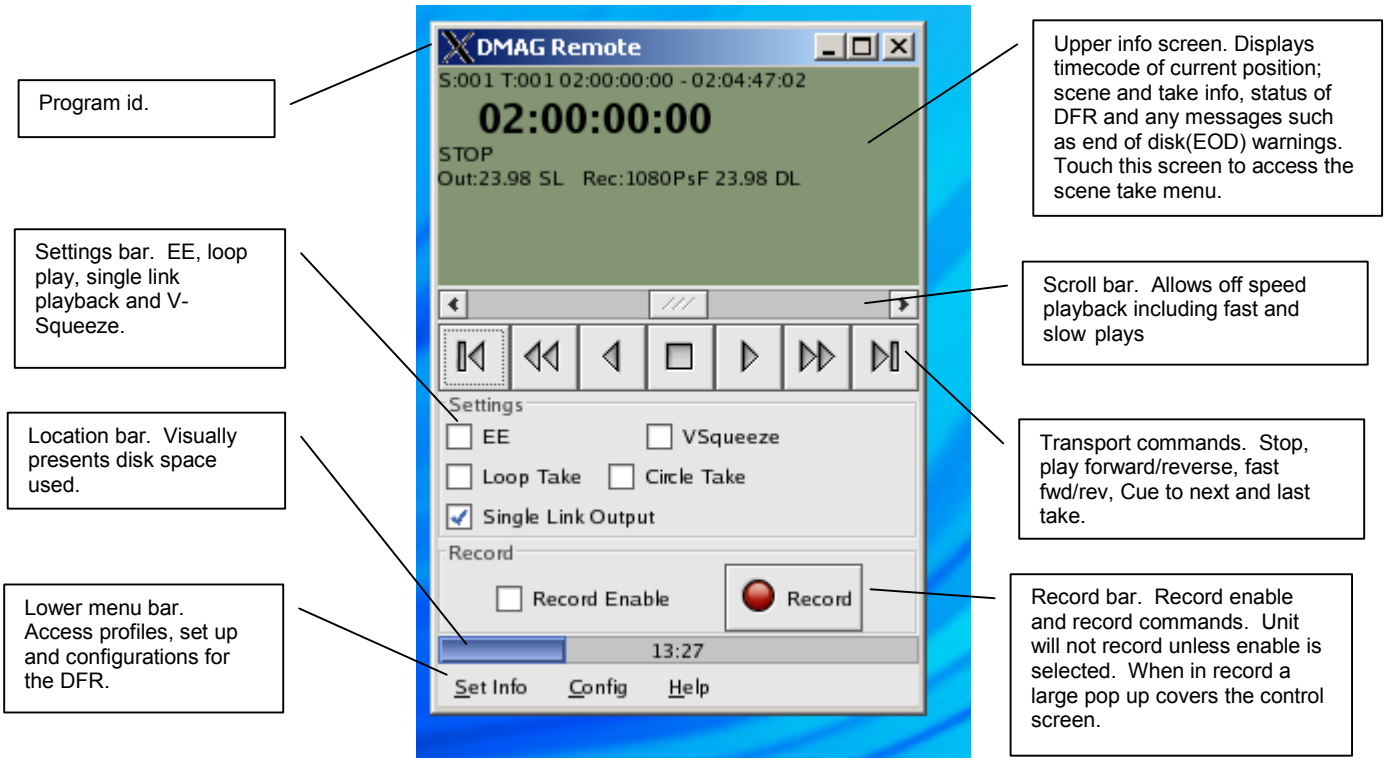
Type ssh dmag@192.168.0.52 ./dmagremote

The cursor will prompt for a password, use dmaguser. This will automatically start the application and close unused windows and allow for operation with the computer, mouse and keyboard.

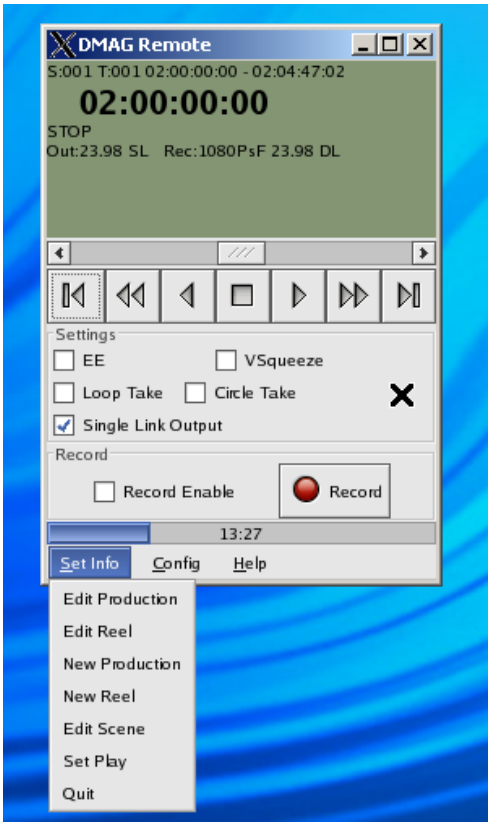
When using a Linux computer, all you need is to open an Xwindows terminal and SSH into the DFR. The dmagremote program can be found at /home/dmag.

Main Menu

The main menu is displayed when the lower left hand button on the PDA is pressed. The screen will display an updating info pop up when communications are first established. The PDA is fetching the reel, scene and take info of the current D.MAG from the DFR.



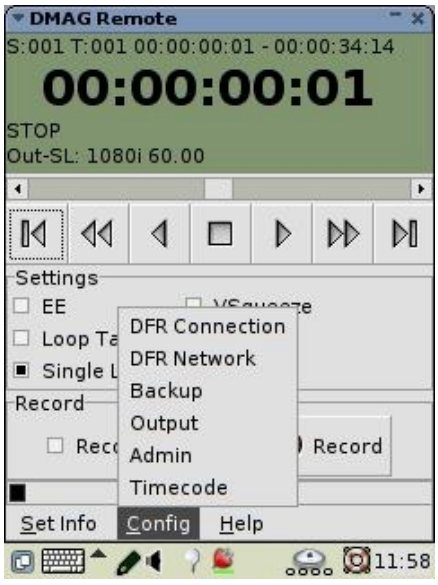
Lower menus, Set info, Config. and Help



These are direct access menus that lead to any of the settings and info screens. You can use them to jump from one menu to another. This lower menu bar is always available on every screen.

The set info menu leads you to the NEW PRODUCTION, EDIT PRODUCTION, NEW REEL, EDIT REEL and EDIT SCENE info screens and SET PLAY playback menu. Each of these screens allows the user to input information that tracks with the material. In some cases the information is also stored in the data header or file name. Each of these menus are discussed below.

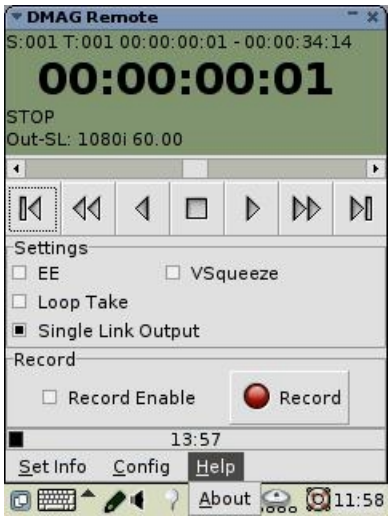
The keyboard symbol in the lower right turns on the keyboard pop up for data entry. The arrow next to it allows the user to change between keyboard or handwriting for data entry.

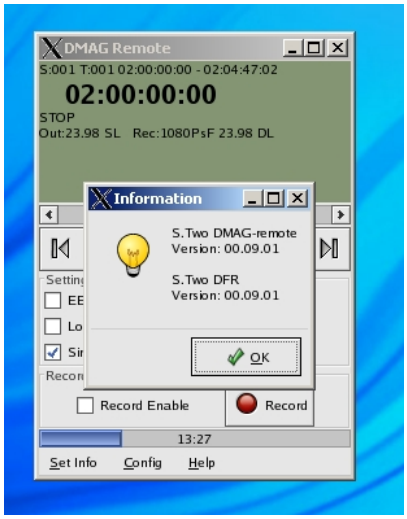


The Config Menu leads to various configuration set up menus, DFR Connection, DFR Network, Backup, Output, Admin and Timecode.

.

Help





ABOUT will display the dmagremote program version.

Help files are not yet on line. They will include on line versions of this manual. The index leads to a searchable text for answers to any questions about D.MAG use.

The other choices are fast links to the most asked questions about the subjects listed. The iPAQ entry leads to the iPAQ main menu for any PDA associated issues.

Starting From Scratch

Start here for operation

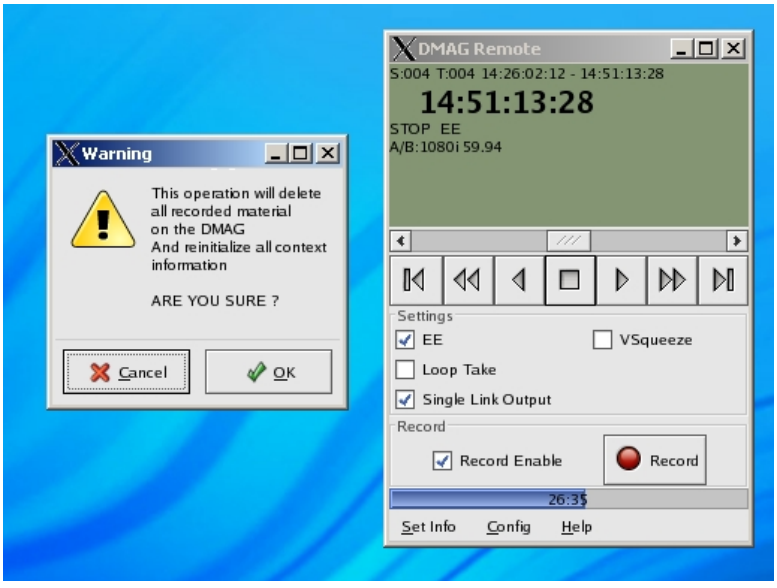
The D.MAG creates files of each frame coming that it records. Each file is named and numbered. The name and numbers reflect the reel, scene and take information and the directories that they create and named. The number reflects the timecode number associated with that frame, it is a base 10 version of the frame rate of time code, i.e. a timecode value of 01:00:00:00 for a 24FPS recording would have a frame number of 0086400. An XLS spreadsheet program is available that does these conversions for you from / to frame number / timecode on our website and on the S.Two CD that accompanies this manual.

The reel, scene and take names are generated automatically using default values or by the user in the New or Edit Reel, New or Edit Scene or Edit Take dialog boxes. Reels name the DMAG but not a directory. New scene prompts the user to enter a name to match the scene name from the shot or slate. A take is automatically named but can be renamed after a record.

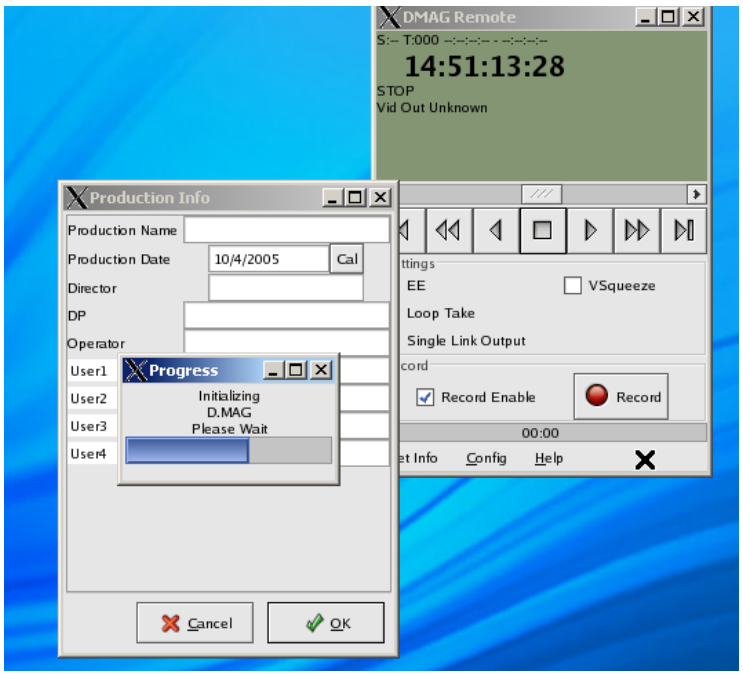
All these names become part of the metadata essence for tracking of scenes, shots and frames through a production. This information is carried in the DMAGINFO.TXT file, in the headers of each frame and on the auto front and end slate generator if used. Setting these is all done in the dialog boxes.

New Production

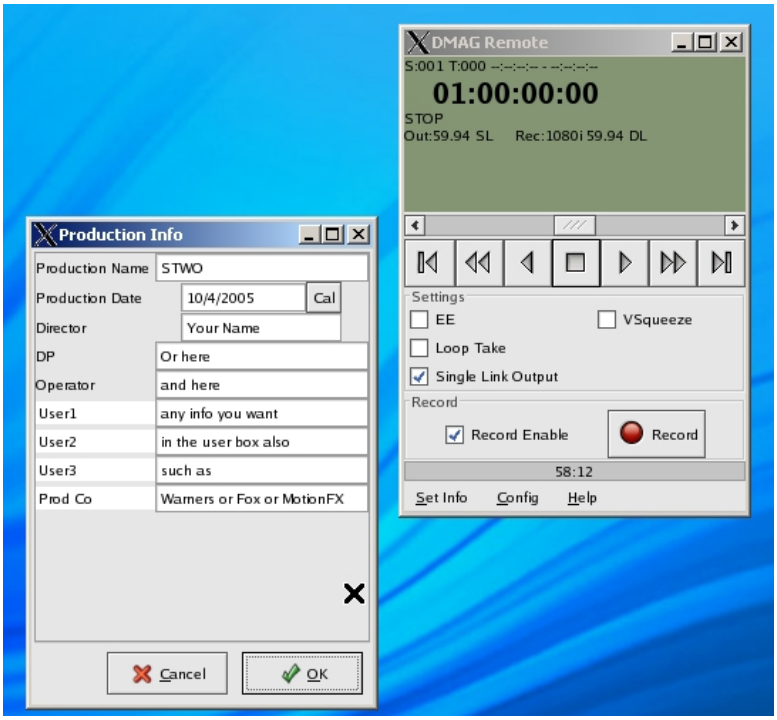
Set a New Production when starting a project. A New Production will erase and reformat the D.MAG magazine and allow you to set information about the production that doesn't change. When you start a new production a dialog box appears warning you that this will delete all material and re-initialize the dmaginfo and context files. This step has no undo level so make sure that the D.MAG loaded is one with material that you want to delete. It is unrecoverable!



It is good practice to initialize all the D.MAG magazines that will be used on a project to the production at the beginning of the Production. Once initialized once then the New Reel will allow the auto fill in features. This means setting New Production on each D.MAG.

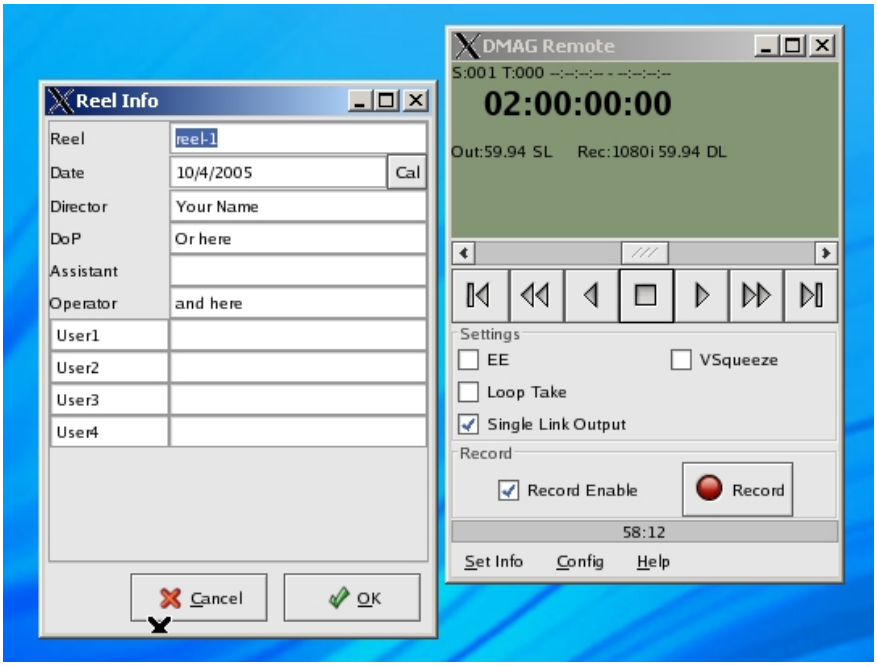


Once you hit OK a dialog box will appear showing the progress of the DMAG initialization.
Behind you can see the Production info dialog box. This takes a few seconds to complete depending on the size of the D.MAG.

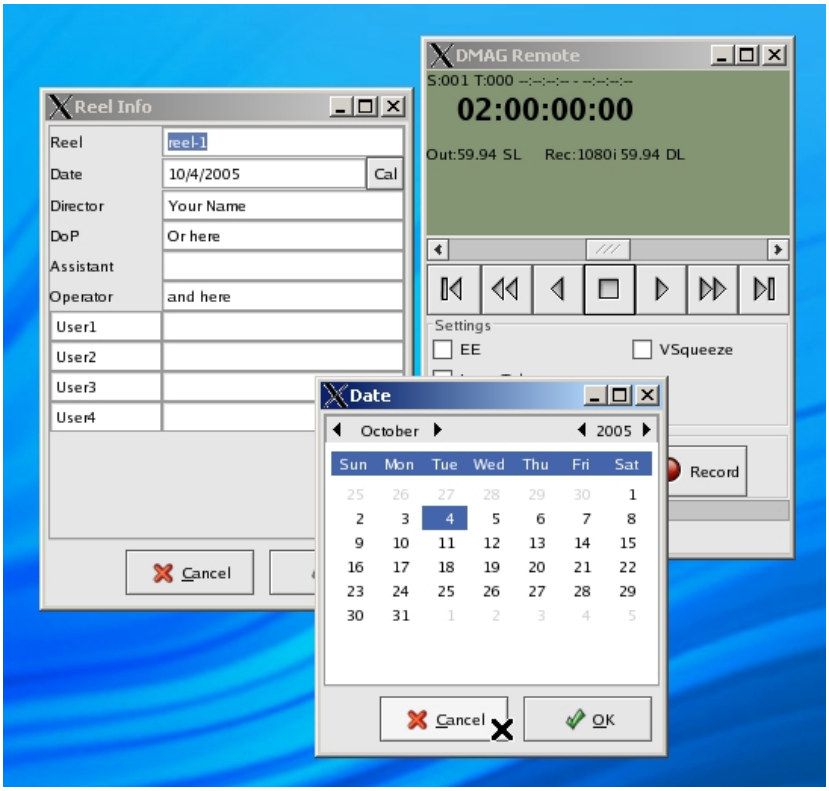


Once complete, then you can fill in the dialog boxes. The CAL is Calendar for setting the date. This is auto read from the DFR internal clock and should auto set. If it has the wrong date then see setting time/date
The Production Name, Director, DP and Operator will all carry over to each Reel info automatically once set here. The User1 –4 boxes can all re user renamed for any additional info such as production company that you may want to stick in. This information is listed in the end slate and DMAGinfo. When you hit OK the Reel Info dialog box automatically appears.

Reel Info – New Reel



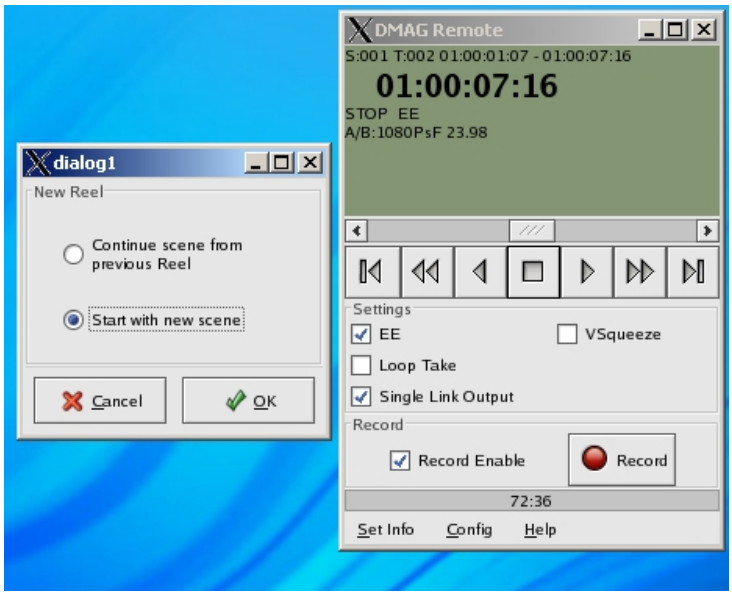
This comes up immediately following the OK tab from the New Production info box. Name the Reel much as you would a film roll. Make sure that no two reels in a production are named the same. The Reel Name is part of the frame name. Any symbols or punctuation used will be auto converted to an underscore in the name but will appear normally in the slate and DMAGinfo. The Date, Director, DOP and Operator names will auto fill in based upon the Production info filled in previously. The User boxes can be filled in as above or with any new info pertaining to that reel globally.



Hit the CAL if you want to reset the date.
This is the date that will appear on the slate and in the header.

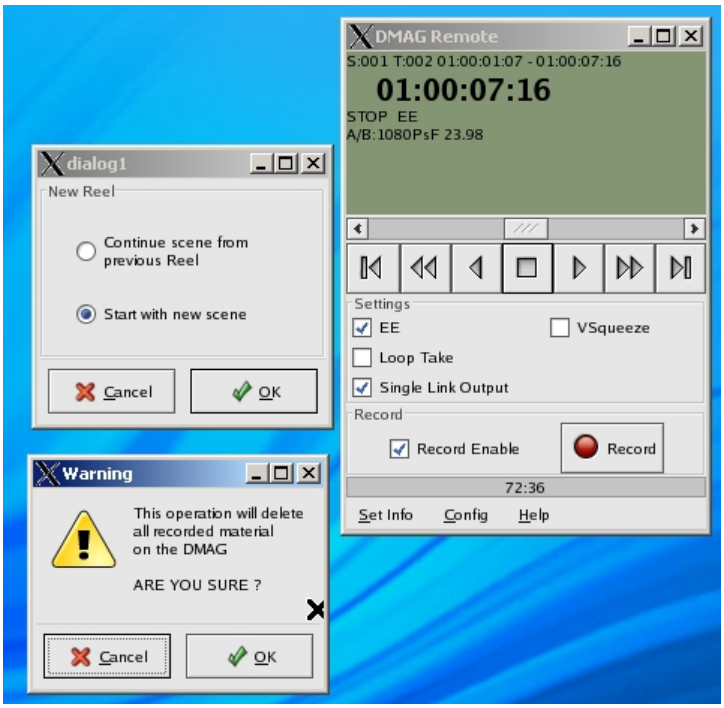
Creating a New Reel

Once in a production, then use the New Reel Command from the Set Info menu. The choices are either continue with scene from the last magazine or start with a new scene.



The continue last will carry over all the information from the last scene and take recorded on the DFR and use that for the next take which will be numbered as the next take from the last magazine.

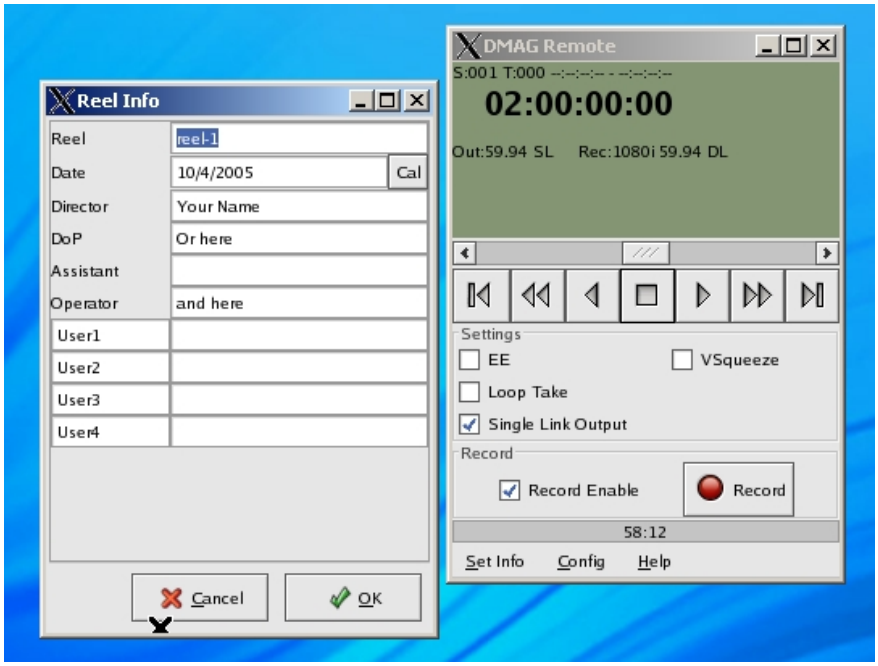
Start with a new scene allows the user to change video parameters, timecode start numbers and all other user set ups for the new magazine. The first take will be take one.



A Warning box is shown, touch OK to continue.

WARNING ALL DATA WILL BE LOST ON THIS MAGAZINE. This step has no undo level.

When you hit Ok a brief progress box may appear while the D.MAG is erased and then the Reel Info dialog box is displayed.



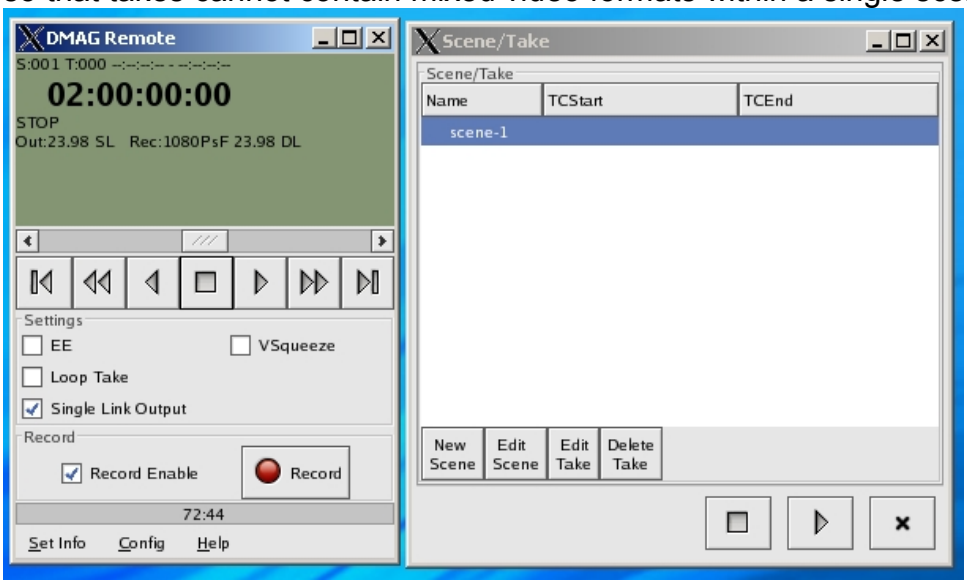
Fill in as noted above in New Production.

Once data is entered touch APPLY to save data. The box disappears and edit Scene Scene may appear depending on whether this is a new reel or a continue last.

Video and file parameters are be set in the edit scene menu as can scene names etc and timecode.

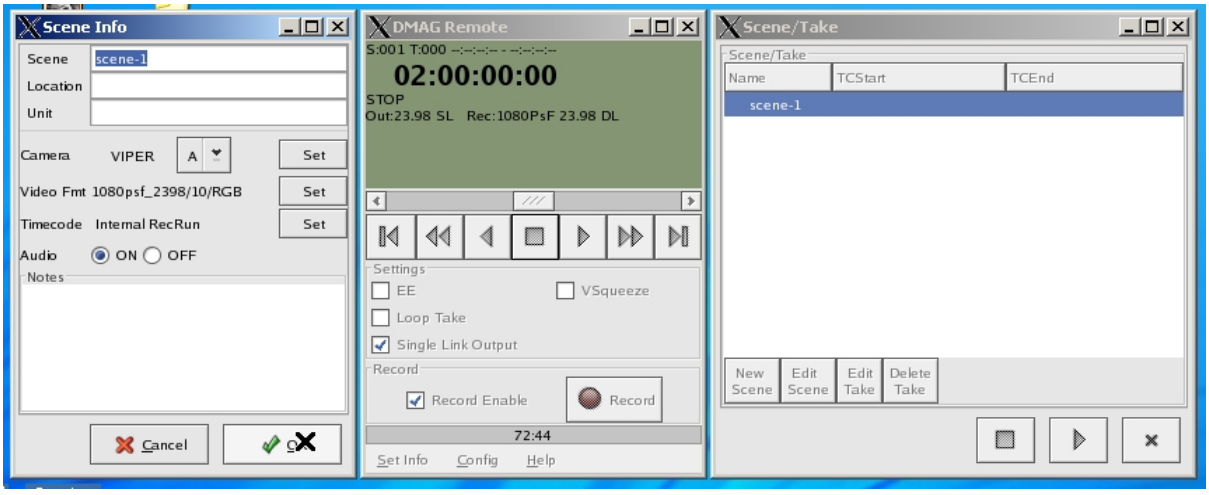
Scene Menus

New scenes can be created from the scene take list menu or as part of the new reel process. The Video, timecode and file parameters can only be set on a scene basis so that takes cannot contain mixed video formats within a single scene.

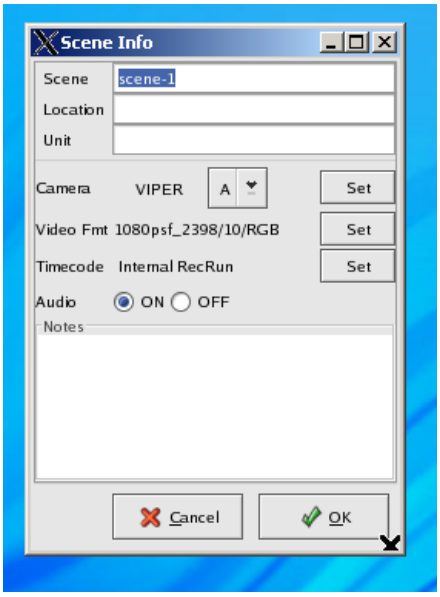


The Scene /Take window is accessed by touching the main timecode window on the DMAGRemote. This lists all Scenes and takes on the magazine. This winsdow is resizable by dragging on the edges or corners.

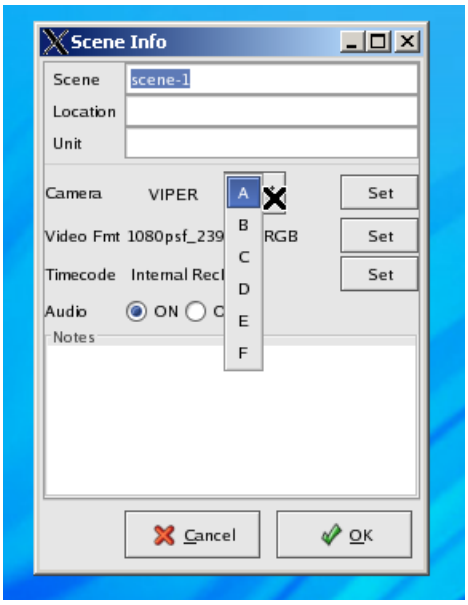
This window has buttons for editing the Scene, the Take and for adding New Scenes and Deleting Takes. This is the only place where a Take can be deleted from. The Edit Scene Menu button appears here and in the Set Info Box.



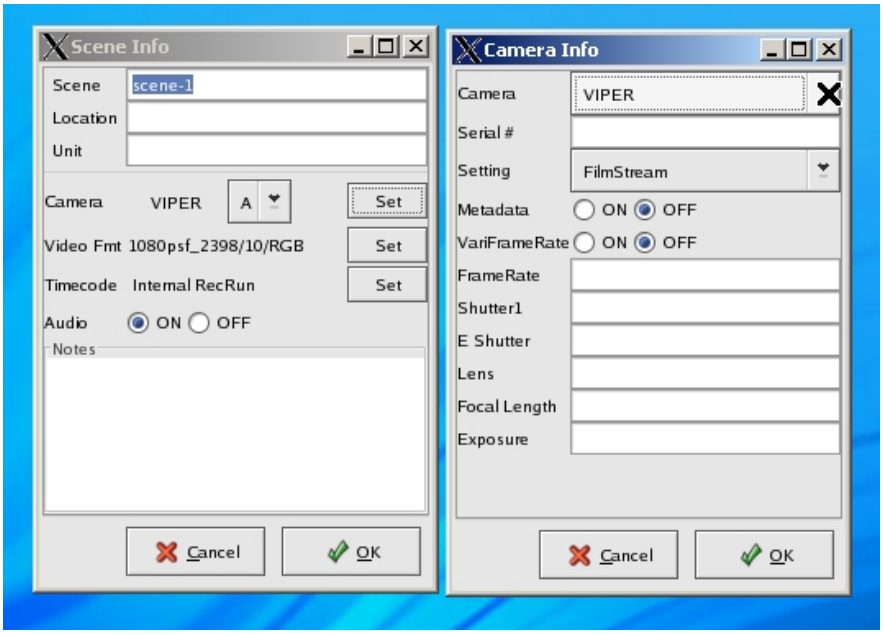
The Scene Info dialog box appears when edit Scene is selected as an additional window. Again the user can name the Scene to match the Slate or shot name as they would in a traditional Film Shoot. This appears on the Auto slate, the DPX header, the DPX frame name and the DMAGINFO file.



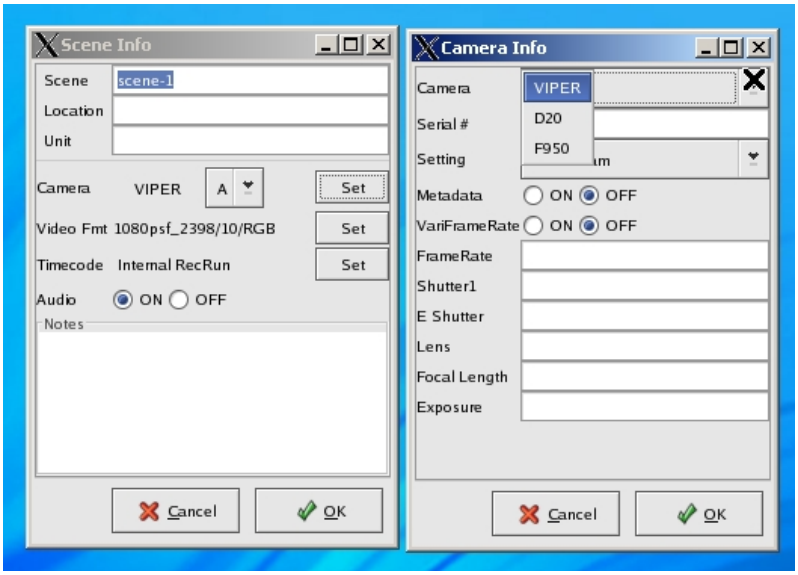
The user can set the scene name to be anything using the keyboard. Add a Location and a Unit if shooting second unit or use as further identifier. This information appears on the Auto Slate.



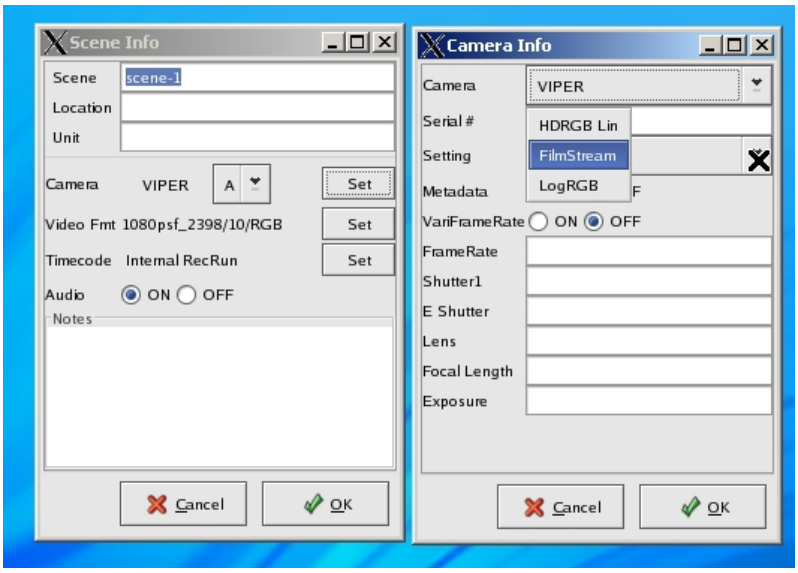
The Camera ID is part of the DPX frame naming convention and should be set when using multiple cameras for later tracking and identification when using matching timecode. It also appears on the Auto Slate



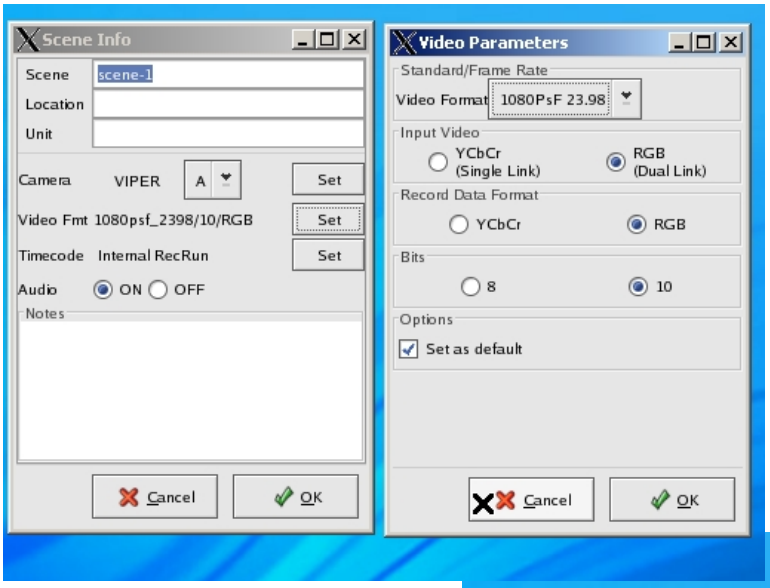
Set Button next to the Camera accesses the Camera Info Dialog Box. This sets up various information tracking for Metadata use later in the production. The information appears on the Auto Slate and in the end slate.



The Camera selection sets certain defaults in the DFR. Mainly these are the trigger and tally electrical settings for different cameras. In the case of the Arri D20 however this also turns on the tagged frame format supported by Arri and S.two for variable frame rate recording.



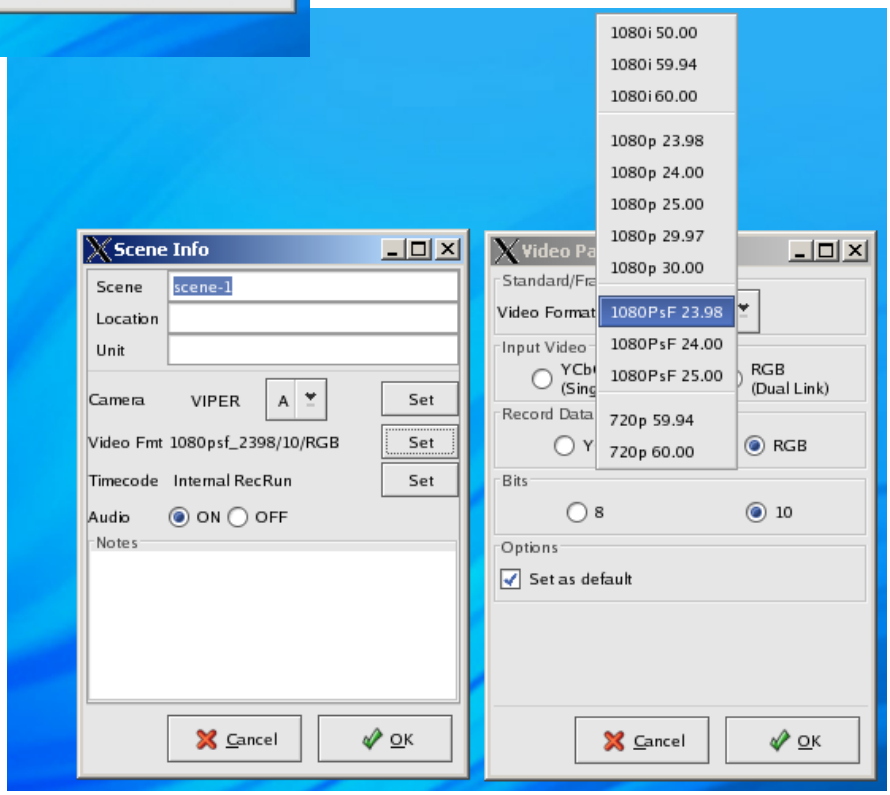
The setting for color type is informational only so that Post Production knows what is shot. For instance Viper Cameras are mostly set to FilmStream mode implying a specific Log color space. Some Viper users may use HDRGB linear space and all Sony cameras ONLY support linear space. The LOG RGB is for the new generation of Single chip cameras such as the Genesis and D20.



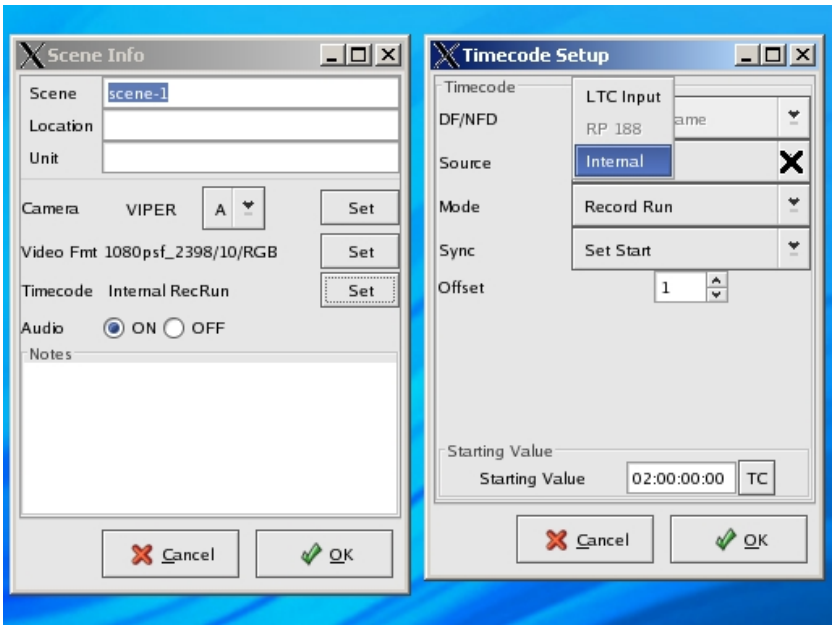
The Set button on the Video Fmt line sets the video format for recording formats and inputs of the DFR. These can only be changed when creating a new scene.

The set as default button when checked will save the selection as the default.

The default format for the DFR is 1080 PsF 23.98 with RGB Dual link input, 10 bits and an RGB recording format. The user can select the video format independently of record format, so that a single link 4:2:2 input source can be saved as an RGB DPX file.



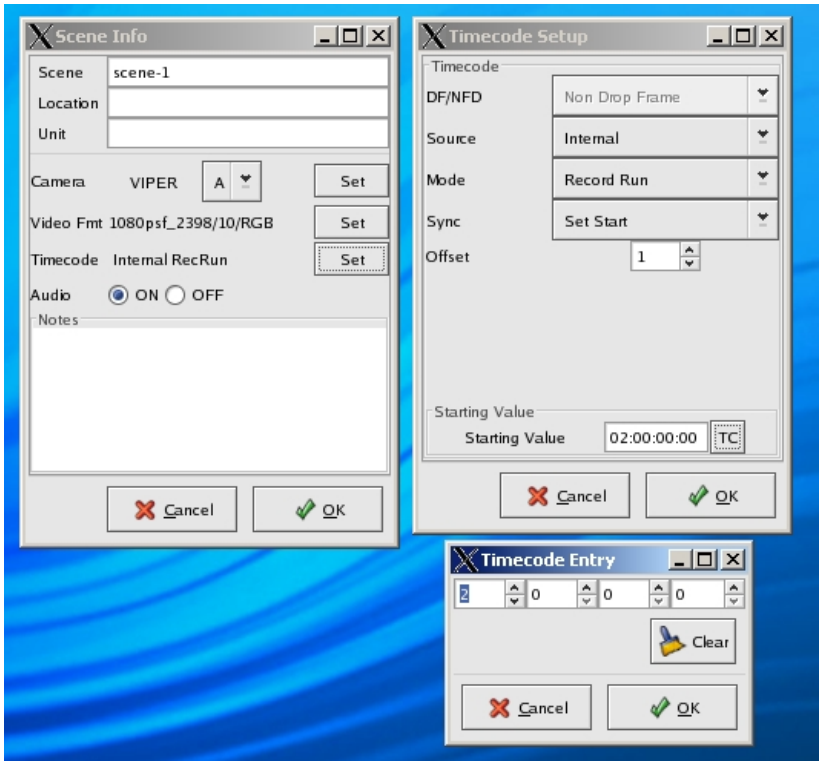
Once selected, Hit OK to return to the scene info menu.



Timecode Setup is accessed via the Set button on the Timecode line. This allows the user to set the timecode of the scene.

The main setting is for either using externally supplied timecode or internally generated code. When set to LTC Input the DFR will look at Timecode on the RP12 LTC IN BNC on the front of the DFR.

!!! IMPORTANT NOTE !!! MAKE SURE THAT A VALID EXTERNAL CODE IS PROVIDED WHEN LTC INPUT IS SET.



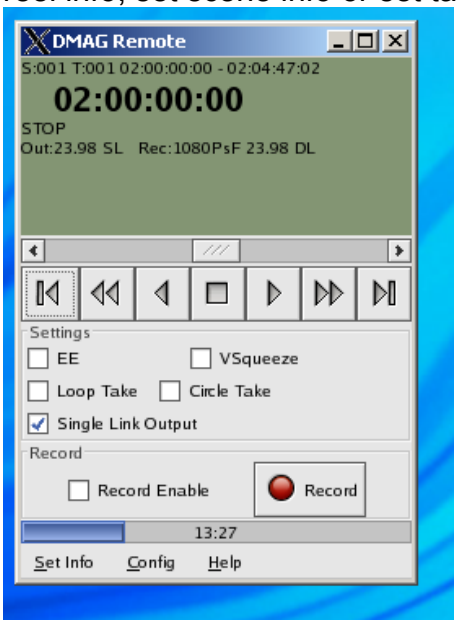
If Internal is selected the user can set a starting value for each Scene. Touching the TC button next to the Starting Value brings up the Timecode Entry dialog box. Clear resets the values to zero. Use the arrow s to increment the timecode value.

When set to internal the DFR defaults to Record Run providing continuous timecode values through out the Scene from Take to Take.

Each take will increment from the last take its take number and timecode.

Using Dmagremote

The main screen is presented after any of the create production screens at the beginning of a session or after a D.MAG load or change D.MAG. If in a different control screen then the program will return to that after information is entered in the reel info, set scene info or set take info screens.



The upper line on the main timecode screen shows the scene number followed by take number followed by start and stop timecode of the current scene. The large numbers show current timecode location and increments in play and record.

Below the timecode is the transport status line, Error messages are also shown in the status space.

Below that is the format status of the DFR including the video output; SL = Single Link, DL = Dual link. When the input video is different from the frame settings or if there are any problems with the input this is reported here, this can include A or B link missing or serious mistiming of the two links. If there are problems with the input signal, the DFR will not record and will display the reason why in this space.

Touching the main timecode display screen anywhere will access the scene take list menu (see below).

Under the main display is a jog bar. The buttons at the end of the bar jog forward one frame, jog reverse one frame, the jog bar can be dragged to jog multiple frames.

Below that are the main transports controls. The middle button is stop / still, the button next plays forward. The end two buttons represent cue next take and cue last take. Cueing to takes and scenes can also be done in the scene take list menu where takes and scenes are listed and can be randomly accessed (see scene take list below).

The settings area allows the user direct access to most used functions.

EE puts the DFR in EE mode from any playback mode.

The LOOP function will play back a take in continuous loop or a scene.

The output menu has a single/dual link output selection. When Single Link Output is selected, the video is routed through a color space converter and is presented on the A link 4:2:2 HD output, the video is also output via the analog and down converter outputs as program quality signals. This feature now operates on EE, Record and playback modes when single link is selected. This mode does not affect the recorded data in any way and is invoked on the video output. The main video output will be full dual link when single link is not selected. A dual link monitor is required to see the HD RGB dual link. The program dual Link can be used to feed other 4:4:4 devices such as color correctors, edit devices and computer cards.

Notes about Single / Dual link. This takes the RGB dual link recorded on the D.MAG and out puts it to the main video out as a single link 4:2:2 YUV HD signal. This is a program feed and can be used to feed the D.MAG output to HD SDI monitors or to an HD VTR. The main out feed carries TC in VANC DATA and embedded audio (if present). The single link is also fed to the HD Analog converter for use with analog monitors and also to the optional down converter output. If the output is set to Dual link, the 4:2:2 A link signal is fed to the HD analog and optional down converter. The A link in this mode carries all of the G signal, half R and half B with no picture integration, this will produce a viewable picture but edges, highlights and color will be less than perfect. With the full implementation of single link there is now no requirement for a full dual link monitor on set for critical assessment of images.

V.Squeeze will display a 2.37:1 picture at the right aspect ratio when using an electronic anamorphic capture system such as Viper. This feature also now works in EE and Record mode to assist with framing and composition when in widescreen mode. This signal is not intended as a program quality fed but is for monitoring purposes and making dailies. This mode does not affect the recorded data in any way and is invoked on the video output.

The RECORD button is not armed unless the user has enabled record. This is set using the RECORD ENABLE button. If record is armed a touch of the RECORD button will initiate a record sequence and start the record the timecode will roll.

Recordings always start at the end of the last recorded take in the scene regardless of the play positioning of the D.MAG. Scenes can be appended with additional takes by cueing to any take in a scene and initiating a record

When in record, a large recording overlay appears. The only button that now works is the additional STOP button on the record pop up. Hitting stop will end a record sequence, the DFR will stay in EE mode ready for the next record to start.

PLAY will take you to the beginning of the last recorded take for instant playback.

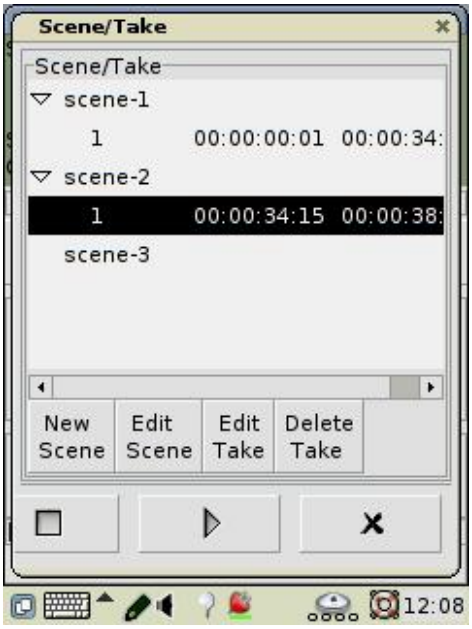
A DELETE TAKE function can also be found in the scene take menu accessed by touching the main timecode display screen.

The STOP button ends playback with a still frame.

PLAY will start to play the take selected.

Navigating Takes – Scene – Take List Menu

Touching the main timecode display area on the main screen will bring up the scene – take list menu.



The scene take lists all scenes and takes on the D.MAG. The scenes have a small arrow next to them. When the arrow is horizontal the display is collapsed to show just the scene name or number. If the arrow is vertical then the display is expanded to show the takes under that scene.

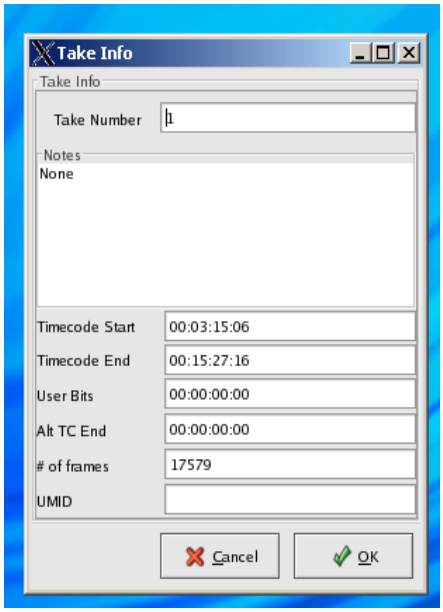
Touching a scene or take cues the DFR to that scene and take. As each scene can have different video parameters set, changing from scene to scene will change the settings of the DFR to reflect the format that was invoked for that scene. Play and loop are scene functions so that a play will play from the take selected in the scene to the end of the scene. LOOP will loop from the take selected to the end of the scene.

Although scenes cannot be deleted, empty scenes will be automatically deleted when the DFR restarts or the info file is reloaded.
The highlight bar will move with the play so that the current take is always highlighted when in play mode.

Delete Take will delete the take that is highlighted, A confirm delete pop up asks for confirmation. **DELETE TAKE CANNOT BE UNDONE**.

Hit OK to delete the take, cancel to save it.
A Note about Deletes. Although you can delete any take any where at any time. It is recommended to delete takes in groups
from scenes or when the magazine is near full.

When the timecode used in the DFR is set to rec run, it is continuous from take to take. When you delete takes the timecode for that take is also deleted. This will lead to discontinuous timecode when playing back which may cause problems when making dailies video tapes or using an external controller.

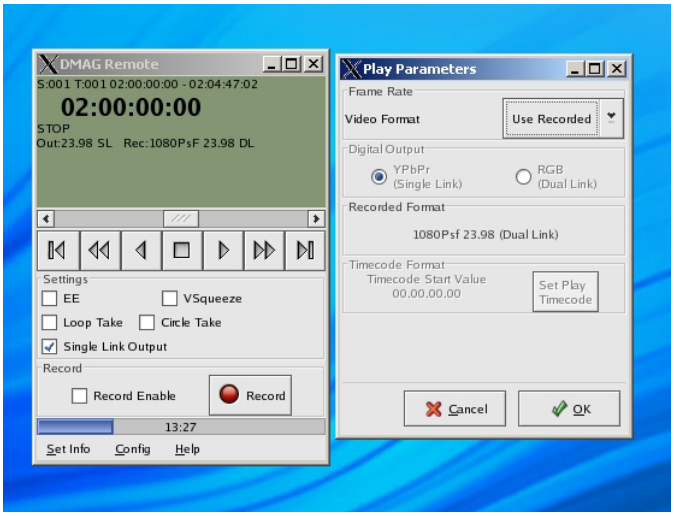


Notes can be made in the Edit Take screen accessed from the Scene/Take menu. This screen also accesses information about the specific take including start / end timecode and how many frames are in the take.

This screen automatically pops up at the end of a record when using a laptop or external computer to run DMAGremote. It requires touching the Ok to go away. This is for easy renaming of take names or to add take notes that will appear on the Autoslate system.

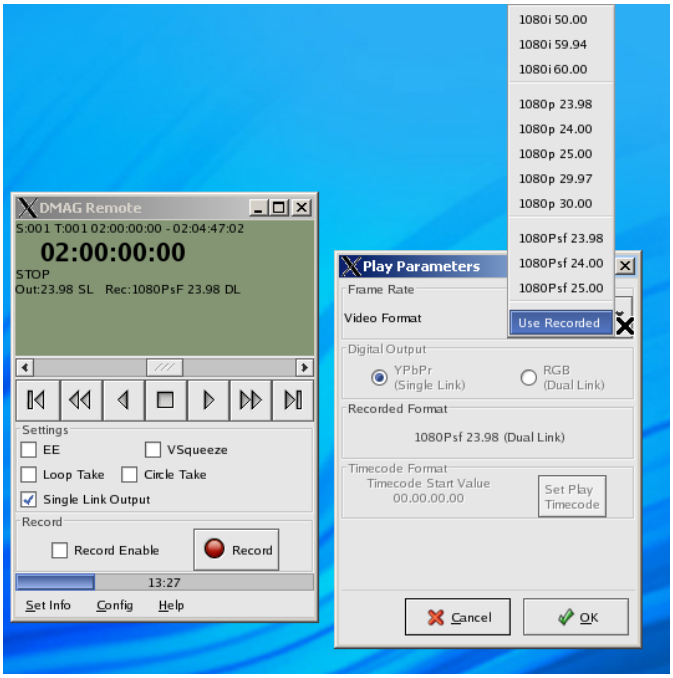
Once you hit OK the DFR will do any updating of information required including re-writing DPX headers, DPX frame names and making any changes to the Autoslate. A progress box will appear for a short time while these changes are being made.

SET PLAY MENU



This new menu allows the user to set a different playback speed for recorded material. The main screen displays both the recorded frame rate and the output frame rate along with whether the DFR is set for single or dual link output.

The SET PLAY menu can be found in the SET INFO lower menu from the main screen.

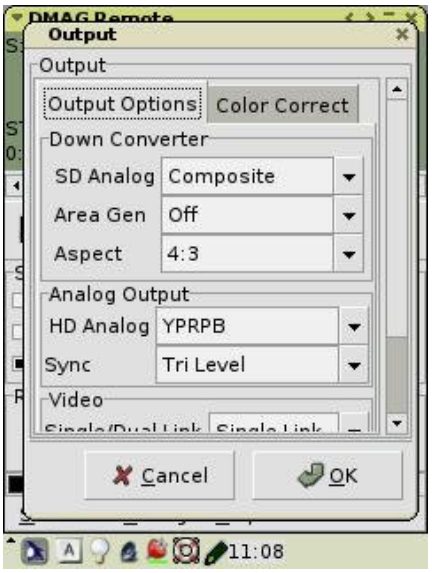


Touching the video format arrow will ring up the selection of possible play speeds.
NOTE: When on set and in a record environment, have this selection set to use recorded as the normal setting. The play speed is exactly that, a possible play speed and is not active in EE or record modes. If checking a shot at a different speed on set, always place the setting back to 'use recorded'.

The current implementation does not change the recorded timecode as presented on the ANC data, LTC or RS422 timecode outputs.

The main message area will display the original recorded rate plus the new output frame rate. The Main LCD on the DFR will only display the record frame rate.
The default setting is 'Use Recorded'.
The audio if recorded will mute when using a different play frame rate.

Output screen



The output screen contains several user set up for playback and erase.

The optional down converter can be set to provide either a three wire component analog signal in either YUV or RGB, the YUV can be set for analog Betacam SP to allow the connection of an analog VTR or standard YUV. Changing to Composite mode gives one composite analog signal and one Y and one C for S-VHS type signals. All SD outputs including the SD SDI follow the frame rate of the main DFR, 25 FPS gives out a PAL signal, 29.97 FPS gives out an NTSC signal. In the case where 23.98 frame rate is set, the down converter automatically adds 3:2 pull down and provides an NTSC and 525 601 signal.

The aspect ratio choice allows the down converter to provide a variety of different SD aspect ratios on the SD outputs, all SD outputs follow the choice. 4 x 3 will invoke a 4 x 3 aspect ratio using a center cut of the 16 x 9 picture. 4 x 3 letter box gives the full 16 x 9 in a letterbox, 16 x 9 feeds a wide screen SD signal out, 4 x 3 reticule overlay shows the 16 x 9 in a letter box format with a 4 x 3 overlay for center protection.

The main HD analog outputs of the DFR can be altered. SVGA switches the analog signals to the SVGA connector on the main connection panel. The signal is RGB full bandwidth analog HD at XVGA rates. A multi-sync computer monitor is required to view the signal. Many VGA monitors will not lock to the slower rates of 23-25 FPS. RGB\YUV feeds HD out the analog 3 wire BNC connectors on the panel.

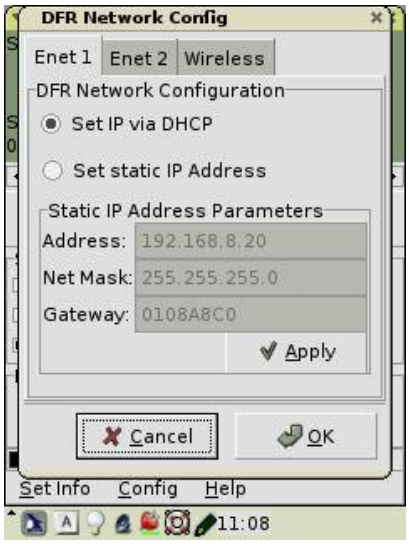
The user may add a 2D Look Up Table (LUT) to the output, the D.MAG is loaded with a LUT for use with 10 bit linear signals using a Curve for use with Thomson FilmStream products. User defined LUTs can be loaded to a profile in the main DFR system via the Ethernet connection. The LUT can be applied to the YUV or RGB HD output. Please contact S.two service personnel for LUT information and to place your own LUT in your DFR.

The main video output will be full dual link. A dual link monitor is required to see the HD RGB dual link. The program Dual Link can be used to feed other 4:4:4 devices such as color correctors, edit devices and computer cards.

Network Menu

Found under the Config lower menu bar, the Network menu reports the Ethernet network settings of the DFR and allows changes to be made.

The first screen on the network menu displays the current IP address of the Ethernet port and whether it is static set or DHCP enabled.



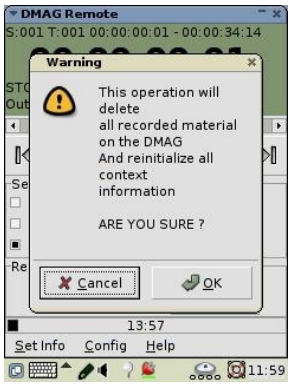
Use the ENET 1, ENET 2 and Wireless tabs to config each port. ENET 1 is main ENET port, ENET 2 is the ENET port found adjacent to the power sockets, the wireless port is optional.

There are two main buttons in the change Ethernet setting menu. If you touch the Automatically Set IP with DHCP, this starts the DHCP client in the DFR which will automatically connect with an attached DHCP network. The IP addresses and all other address information required is set without user intervention from the external DHCP server. IP address for ENET 1 will be displayed in the main network menu window and on the front LCD panel on the D.MAG.

If you touch the Statically Set IP Addresses you will need to enter the IP address, subnet mask and gateway default address. These should be obtained from your network system administrator. The subnet is automatically filled in to be 255.255.255.0 but can be changed with the stylus.

ADMIN Screen

The Admin screen is accessed from the Config lower menu. There are two types of erase supported by the DFR, a quick erase and complete erase. The complete erase features secure replacing of image data with random digital bits and can take some time. If you are erasing a magazine to go straight back into production then QuickErase is sufficient. This removes the file allocation table allowing the file system to treat the magazine as unrecorded. The data that is on the magazine is replaced by new material during capture. Use this erase for in production recycling.



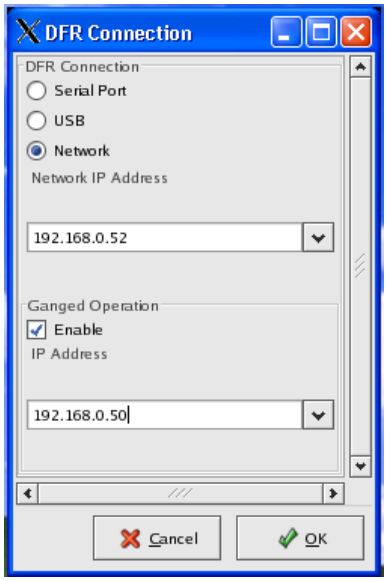
Both Erase functions have NO UNDO so beware before confirming erase commands.

Power off button will produce a confirm screen and then power down normally. Reset command resets the DMAG software and re-initializes the video hardware. This reset is very useful for looking at input and camera problems. The command also has a step to confirm before operating.

Reset button resets the D.MAG operating program and the hardware video card. Use this button if having issues with input sensing of A and b links.

Change D.MAG button: Touching this button will prompt a dialog allowing the user to change magazines without having to cycle power. Change D.MAG halts file system use of the D.MAG and powers it down allowing it to be removed safely, the dialog box will prompt the user to replace the magazine with a new one and then start the new reel process. This is many times faster than a power cycle. The magazine cannot be changed if any other user is logged into the system. A dialog appears telling the user this if a DMAG change is initiated with a user logged in.

DFR Connection Menu / Ganged Operation



This menu allows the user to select the PDA / DFR connection. The default, is via the serial port found on the 26 pin option break out cable.

When using a laptop to run the Dmagremote program select the network button and make sure the IP address matches that of the DFR connection that you are using.

From DFR version 0.6.7 onwards it is possible to use two DFR ganged together using a single dmagremote panel over a network. To achieve this it is important that both units are set up identically. Both systems must be running the same software version. The systems are connected to the controlling PC via a network switch, router or hub. The two DFR have to have different IP addresses on the same network. In this example we are using adjacent addresses but they can be any valid address.
Connect to the master DFR and open dmagremote normally. In the network connection menu select 'ganged operation' and enter the Ip address of the other DFR and hit OK. The two systems are now master and slave and will both do the same actions. To make sure both DFR are set up the same it is preferable to do either new production, new reel or at the very least new scene and set a new timecode start and make sure that the video formats are the same by setting them in the scene menu.

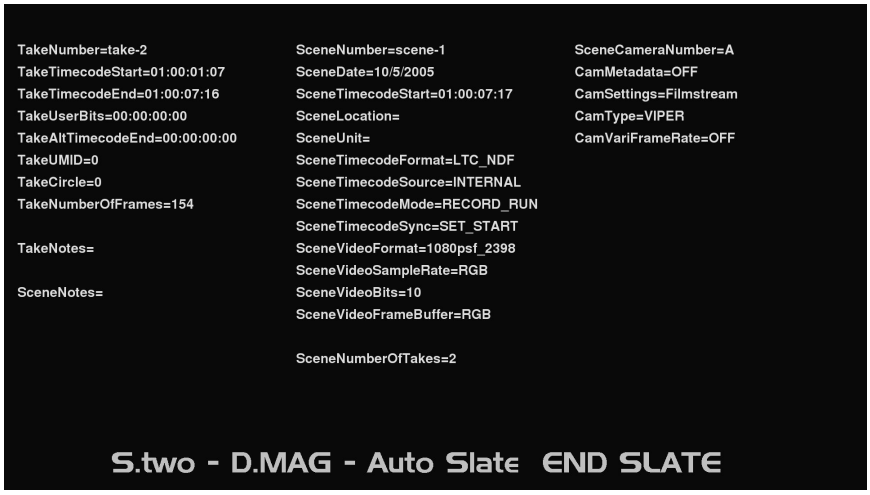
A diagram is included in Appendix I for suggested cabling set ups.

Auto Slate

S.two have provided an Auto Slate feature in response to user requests. The slate can replace the traditional hand held shot slate for information and identification of each shot and scene. The Slates compromise both a Start and end slate. The start slate is very traditional in form with needed information, the end slate represents a new form unique to Data capture, it prints to screen ALL the Metadata that has been collected about the Scene and Take including start / end timecodes, number of frames in the take and any notes. The end slate is designed to be legible in SD or HD compressed offline systems as a visual note carrier for editors and editorial assistants.

The Auto Slate system can save the production time and media and creates a less stressful shooting environment for on screen talent. Slates are written to the D.MAG at the end of each recording. Slates are updated to reflect any editing or additions to Scene and Take notes or Reel information. The front slate appears for 5 frames at th start of each take, the end slate for a single frame. The slate can be turned on or off from the _____ menu.

The information is automatically found from the Production / Reel / Scene info and Timecode and User bits. The Notes come from the edit Take box that is automatically popped up at the end of each record when using DMAGremote on an external computer.



Troubleshooting

Error messages

Input Mismatch – Displays this error when the A and B links of the dual link input do not match. Make sure the dual link cables are coming from the same device and that the cables are roughly the same length and type.

Format Display – The LCD displays the input format of A and B links in EE and record mode and the output format in any of the play functions. It also displays Dual Link (DL) or Single Link (SL) when selected.

The DFR has full auto sensing of inputs and shows when A and B links are present or not. The DFR will not go into record if the signals do not match the input and format settings or if one link is missing in a dual link format.

No signal- There is no video applied to the input detected.

An EOD End of disk message is displayed when the system has less than three minutes remaining on the magazine. In addition the tally light will start to flash. At One minute the EOD and tally lights will flash at a quicker rate. At 30 seconds the rate will be faster still.

D.MAG Full – D.MAG magazine is full. No more recording is possible until the D.MAG is replaced or erased.

SVO: FRAME ERROR - the SVO message will appear on the main LCD screen if a frame error is encountered on record or playback. Frame Error is reported in the main screen on the dmagremote program. A frame error can occur if there is a problem with the input video or a problem with the D.MAG magazine. If a frame error is reported the DFR will go into stop mode. To clear the error condition, record or play again. This issue has been observed after many hundreds of random deletes on a magazine during a capture. IF the error is repeated on the same magazine several times then there may be a potential disk problem or disk fragmentation issue. Erasing the magazine should remedy the problem.

No COMMS – Displayed on the dmagremote. Usually means that the program is not communicating with the DFR. Check the cables and that the DFR is powered and that the DMAG program is running on the DFR. This is indicated by the timecode number being displayed on the main LCD. Check that there are no error messages on the LCD. In the DFR connection menu under config make sure that the program is using the right connection, either serial if using the PDA or network if on a laptop and that the IP address is set correctly if on a network interface.

OK Now I have all this data, what do I do with it?

The single largest issue with digital image data capture is the large amounts of data that can be created in a relatively short time. The D.MAG system has been designed to address data sharing and use as well as solving the capture issue. There a variety of docking stations available from S.two that allow D.MAG magazines to be mounted as normal computer accessible volumes with directories and files for images. These docking stations are described in Section 4 of this manual.

Offloading magazines with the DFR

There are principally two methods for offloading data once captured with the DFR.

1. Real time video playback. There are increasingly more post systems that are able to take in and use RGB dual link HD video data. These range from color correctors through to some workstations. These devices often are able to capture timecode from the RP188 VANC data stream that the DFR outputs with video. The upside of real time connections is that it is real time, transfers take actual running time, the downside is that much of the metadata and the file structures are ignored. RP215A does provide a mechanism to pack some of this metadata into the ANC video data space, but not all and is so far not widely supported. In addition to workstation and dual link native devices, there are video tape options, these all have several drawbacks, not least being compression of material which may to some users be objectionable or even unacceptable. The DFR does allow the playback of dual link data into a single link standard HD video recorder and concurrently an SD video recorder, again the metadata is lost (except for timecode) but this is being used for dailies tape creation. As an archiving solution however this is not satisfactory. The majority of devices with dual link video connections do not accept full range 10 bit video, many of them require that the black and white bits be set to normal SMPTE standards. This is true of dual link VTR's.
2. Network connections. The DFR features dual gigabit Ethernet connections which have been tested at very high data rates for transfer. Both connections can be used together for even faster transfer modes. The easiest way to transfer data over network connections is to use an NFS mounting point. The DFR has full NFS capabilities. This provides the fastest transfer rates and ensures that the data files are transferred as native DPX files with all the associated metadata and take, scene, reel and production information. The system administrator for your network can use standard tools to achieve fast data transfers directly from the D.MAG or allow network users to use data from a mounted D.MAG within the programs they are already working in. An example is connecting to network that has an SGI workstation running Discreet programs such as Flame, Inferno or fire. The Discreet programs can use the D.MAG DPX files with out having to ingest them t local storage as a the DFR is seen as a NAS network attached storage device. The DFR has been used many times in this mode, as well as with systems as diverse as Thomson Specter and Quantel iQ.

3. Off loading magazines with Docking stations

1. A.DOCK Archive Docking station

The A.DOCK D.MAG docking station is a station that creates data tapes in conjunction with an automated tape library. Easy to use on location or in post, the A.DOCK has a simple button push interface for starting back ups and creating tapes. The tapes have unique identifiers and bar codes with the A.DOCK creating a tracking database. The A.DOCK can make two identical clones of the data so that a security copy can be held while the master is in transport. The A.DOCK features an internal large cache so that D.MAG magazines are offloaded at high speeds and the cache lay off to the slower data tape media. The data tape created conforms to industry standards and practice so can be restored quickly and efficiently in any computer environment. The tape library holds 4.8 terabytes of uncompressed data on line and tapes can be loaded and unloaded at will. All this is easy to manage with automated back up and database functions. The A.DOCK-V option adds real time HD video output with RS422 control.

2. C.DOCK Clone Docking Station

The C.DOCK D.MAG docking station is a simple to use multiple D.MAG station that allows for high-speed D.MAG media cloning. The C.DOCK features dual D.MAG receivers allowing cloning from one to another for security cloning or distribution of data,. The dual receivers and dual Gigabit Ethernet network ports also allow for two D.MAG digital film magazines to be accessed across multiple networks concurrently.

3. E.DOCK Network Docking Station

The E.DOCK network docking station allows for a single D.MAG digital film magazine to be accessed across multiple gigabit Ethernet networks. Supporting all major network protocols including NFS, FTP, Samba the E.DOCK is a cost effective entry to sharing data for any application.

Section Four – DOCKING STATIONS

There are a variety of Docking stations available to allow the D.MAG user to choose the easiest and most cost effective way to offload recorded magazines. Each Docking station also represents a different workflow style to allow any production to maximize the media throughput and match the capture to the needs of the production. All the docking stations share the same basic architecture and are modular in nature allowing users an upgrade path from one station type to another. For more info on docking stations see the Docking Station Users Manual or S.two Docking Station brochure.

The E.DOCK docking station is a network-connected rack mount docking station for D.MAG magazines. Featuring multi-port Gigabit Ethernet high-speed connectivity, the E.DOCK provides plug-and-play D.MAG access from most computer applications, regardless of host operating system or file system.

E.DOCK allows the user to mount a D.MAG digital film magazine as a network resource and share those files around a LAN or WAN. E.DOCK also supports fast file transfers though the use of 'jumbo frames' so that on a dedicated Gigabit Ethernet connection data can flow at the maximum transfer rate. Jumbo frames are supported by a variety of operating systems.

E.DOCK is completely configured prior to shipping for a fast plug and play installation. All operation and log in is via HTML servers.

The C.DOCK is a rack mount cloning station for D.MAG Magazines. The C.DOCK has two D.MAG receivers for faster than real time copying of the magazine for data security. The C.DOCK is available with different options to provide connectivity to outboard archiving and downloading solutions including tape libraries, large RAID systems, individual tape and disc drives and Storage Area Networks.

C.DOCK – FC is a C.DOCK with Fibre Channel connectivity for use with Storage Area Networks (SAN).

A.DOCK is an archiving docking station featuring an internal disk array for fast offloads of magazines as a buffer to an attached SCSI data tape library.

A.DOCK-V Is an A.DOCK with real time HD video outputs and RS422 control.

F.DOCK is a simple docking station for direct fibre channel mounting of D.MAG digital Film Magazines in a Linux environment for faster than real time access to recorded D.MAG images. Currently supported in Grass Valley Thomson Specter 2K DI products.

Appendix

A: Updating the DFR and PDA via Ethernet

B: VTR Trigger and GPI interface

C: Data Template for D.MAG Recordings

D: Software versions / manual updates

E: Travel Cases & shipping DFR

F: PowerCon Power Connector

G: Converting dpx frame numbers to timecode

H: Running dmagremote

I: Dual use Network, with Audio and Sync LTC

J: Useful Third Party Software for use with D.MAG System

K: S.two Programming Interface – API

L. DFR LCP PLUG

M. Software Release Notes

A: Updating the DFR and PDA via Ethernet

Installing DFR software versions

Please read the full instructions before proceeding!

If you want to update the IPAQ too, then you need to plug the ipaq into the USB port on the DFR.

DMAG VERSION 0.9.7 Onwards – NEW DOWNLOAD INSTRUCTIONS

In order to simplify updates S.two has adopted a new packaged download protocol.

Follow these instructions.

1. Download the release from the S.two web site, it can be found at www.stwo-corp.com/update . Download to a directory on the host computer that will be connecting to the DFR via the network connection. Copy the new dmag update files which are named "dmaginstall_xxx.zip" (Where *xxx* is the version number i.e. dmaginstall_097.zip) to the dfr's /tmp directory using file copy as described in the section 'Using Putty to transfer files'. Open a DOS command prompt shell, change directory to putty (cd \putty).

Once in putty use the command pscp making sure that the full path of where the file is to be found is in the line.

" pscp c:\ dmaginstall_xxx.zip root@192.168.0.52:/tmp " The system will ask for a password:

password = dmaguser

Make sure that you check the typing for correct spaces, syntax and spelling.

Where c: is the local drive of the PC, and \ dmaginstall_xxx.zip is the new program. root@192.168.0.52 is the ipaddress of the DFR (the DFR address can be found on the main LCD screen or by using the DFR network menu on the dmagremote program under the config menu on either the PDA or the xwindows interfaces). See network settings in main manual for details.

2. Log in to dfr using ssh program (putty or Xwindows)

"ssh root@192.168.0.52"

3. change directories to /tmp

“cd /tmp”

To check whether the new files are in the directory, type ls which lists the contents.

Unzip the new software by typing

Unzip dmaginstall_xxx.zip

This will unzip a file called “install_091.sh”

The installation files are contained in the file install_091.sh. This file is a self extracting script which contains software updates for the DFR, DMAGREMOTE and operating system.

Install the files by executing the install script

sh install_096.sh

You will see the following output

Verifying archive integrity... All good.

Uncompressing DFR/DMAGREMOTE/OS Update for Software version 0.9.7.....

DFR Version 0.9.7 installation (date)

Installing Operating System Update

Installing DFR version 0.9.7

Installing DMAGREMOTE version 0.9.7

Reset for new software

The software is now installed.

Reboot DFR.

If you are not using an S.two PDA then the update is now complete.

If using a PDA then follow instructions below to update PDA.

Updating PDA

Connect the IPAQ to the USB port and reboot DFR.

NOTE: The PDA over USB runs a network protocol. No two networks can share the same base address. The USB network is set to use 192.168.8.xx. If you are connected via a DHCP server which has given a 192.168.8.xx address to the DFR then you cannot communicate to the PDA when connected. Make sure you use a static address as shown below. For details on network settings see the DMAG user manual.

5. Login to the DFR as root " ssh root@192.168.0.52 ".

type in: " ping 192.168.8.202 "

if it can talk, you should get:

PING 192.168.8.202 (192.168.8.202) 56(84) bytes of data.

64 bytes from 192.168.8.202: icmp_seq=1 ttl=64 time=4.67 ms

64 bytes from 192.168.8.202: icmp_seq=2 ttl=64 time=0.966 ms

--- 192.168.8.202 ping statistics ---

2 packets transmitted, 2 received, 0% packet loss, time 1005ms

rtt min/avg/max/mdev = 0.966/2.822/4.678/1.856 ms

Hit Control-C to get out of ping.

If ping doesn't work, see trouble shooting section below.

6. If the iPAQ is communicating in continue here, otherwise, go to trouble shooting below.

a. cd /home/dmag/ipaq

b. scp dmagremote_0.6.4_arm.ipk root@192.168.8.202:/tmp

password is 'root'

(if you can't log in, see below on how to change the password, you may be prompted by an authentication message as it my be the first time the DFR and PDA have communicated. Type "yes" if prompted.).

c. ssh root@192.168.8.202 Password = root

d. cd /tmp

e. ipkg install dmagremote_0.6.4_arm.ipk

this will take about a minute or two.

If you get an error message indicating that the package has already been installed, use the following command:

ipkg install -force-overwrite dmagremote_0.9.6_arm.ipk

f. Click the STWO icon or the dmag button and bring up the dmagremote to verify the version in the help/about menu.

You can exit the ssh connection by typing exit or by closing the terminal.

When running the dmagremote software, hit help and then about will display the version of dmagremote and DFR software in the current system.

Update Complete!

IPAQ Trouble shooting

What to do if the IPAQ is not communicating during an update.

NOTE: The PDA over USB runs a network protocol. No two networks can share the same base address. The USB network is set to use 192.168.8.xx. If you are connected via a DHCP server which has given a 192.168.8.xx address to the DFR then you cannot communicate to the PDA when connected. Make sure you use a static address as shown below. For details on network settings see the DMAG user manual.

Use the cradle with USB connection not a flying lead for PDA/DFR. The IPAQ takes power from the DFR and will recharge when using the flying lead and this stops the IPAQ updating successfully.

If you get a message that it can't connect and that someone "may be doing something nasty" The this is due to the DFR having a different IPAQ at the same network address in its connection log than the one you are using. To clear this, log in to the DFR, CD /root/.ssh (the period infront of the SSH is important. If you LS you will see a file known_hosts. To delete this file type rm known_hosts. It will ask if you want to delete the file and type in yes. The DFR will automatically generate a new file when required. This will allow you to connect as above.

7. If you couldn't get the iPAQ connected over USB in step 1.

type in 'ifconfig'

You should see the following in the output:

```
usb0      Link encap:Ethernet  HWaddr 5A:E3:0B:63:49:EF
          inet addr:192.168.8.1  Bcast:192.168.8.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:375 errors:0 dropped:0 overruns:0 frame:0
          TX packets:371 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:100
          RX bytes:11725 (11.4 Kb)  TX bytes:26277 (25.6 Kb)
```

a. There was a 'usb0' chunk in the output of 'ifconfig', but you couldn't ping the IP address.
   i. On the iPAQ, from the 'Home' screen click on 'Settings'
   ii. Go to "Network Setup" (You may need to scroll down using the little arrows on the top-right.

iii. select the 'usbf' tab.
iv. For the Address, type in 192.168.8.202
v. For the Gateway, type in 192.168.8.1
vi. Click OK, then log-out of the iPAQ using the toolbar.
vii. Unplug the USB cable, wait a sec, then plug it back in.

b There was no 'usb0' chunk in the output of 'ifconfig'

i. On the ipaq, from the 'Home' screen click on 'Settings'
ii. Go to "Network Setup" (You may need to scroll down using the little arrows on the top-right.
iii. select the 'usbf' tab.
iv. For the Address, type in 192.168.8.202
v. For the Gateway, type in 192.168.8.1
vi. Click OK, then log-out of the ipaq using the toolbar.
vii. Unplug the USB cable, wait a sec, then plug it back in.
viii. Try ping 192.168.8.202 again.
ix. If no luck, unplug the ipaq and reboot the DFR, then follow directions at the top of the page.

To change password on ipaq:

1. From main screen, click "Utilities"
2. Click "Root Shell"
3. Bring up the keyboard.
4. type in 'passwd'
5. Prog will ask for a new password. type in 'dmag'
6. It will complain that the password is weak and ask for it again.
7. You may need to log-out using the toolbar on the ipaq screen for it to take effect.

When running the dmagremote software, hit help and then about will display the version of dmagremote and DFR software in the current system.

B: VTR Trigger and GPI interface

The DFR is equipped with a VTR trigger and tally connection to facilitate using a VTR stop start trigger found on some cameras. The Trigger and tally system also works as an active input GPI to the DFR. Use of this GPI signal will allow the DFR to stop / start recording from external control.

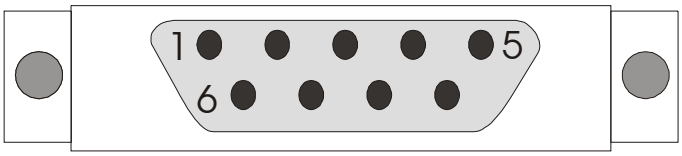
The connection is found on the 26 pin breakout control cable provided with the DFR. He cable has two captive leads both ending with 9 pin D Sub connectors.

The Male 9 pin connector provides an RS232 control interface to the DFR which supports Sony BVW type commands. This connection is usually used with the PDA running the DMAG remote software. Further details on the command set and RS232 interface can be obtained from your S.two service personnel.

The female 9 pin D Sub carries the active trigger and tally connections. The DFR will start recording when the signal on pin 5 goes from 0V to + 5V (nominal). This is a latching GPI rather than a momentary. As long as the signal is held high the DFR will be in record. When the signal goes low the DFR will stop. The tally output is driven from the main DFR operating program, it will become active once the DFR is actually capturing data so can be used as a record confirmation. In addition the Tally has several feedback features for the operator including end of magazine and low battery/power warnings.

Pin out for this connector are:

1 Tally out (active >3V Imped. 10KOhm)
2 Reserved - Option
3 Not used
4 Reserved - Option
5 Ground/common
6VTR Stop / Start (Stop = < 0.2 V; Start = > 4.5 V Imped. 1K0hm.) Active circuit.
7 Not used
8 Reserved - Option
9 Not used



The trigger is an active circuit, this means that the triggering device is required to provide the positive voltage swing from ground (0V) to on (+5V).

An option is available that provides up to four externally operated General purpose inputs, these are preset for record start/stop. Cue to last take and play/stop. Still and play reverse. These triggers can be assigned other uses in the PDA option set up menu.

C: Data Template for D.MAG recordings

```
[PRODUCTION:0]
    ProdName=none
    ProdDate=0/0/0000
    ProdDirector=none
    ProdDp=none
    ProdOperator=none
    ProdUser1=none:none
    ProdUser2=none:none
    ProdUser3=none:none
    ProdUser4=none:none
    [REEL:1]
        ReelNumber=1
        ReelDate=1/13/2004
        ReelDirector=none
        ReelDP=none
        ReelAssistant=none
        ReelOperator=none
        ReelUser1=User1:none
        ReelUser2=User2:none
        ReelUser3=User3:none
        ReelUser4=User4:none
        ReelLastScene=2
        ReelFileSystem=LINUX_XFS
        ReelFileFormat=DPX
        [SCENE:1]
            SceneNumber=1
            SceneDate=11/3/2003
            SceneTimecodeStart=00:22:03:14
            SceneLocation=Not specified
            SceneUnit=Not specified
            SceneAudioChannels=None
            SceneAudioType=Not Specified
            SceneVideoFormat=1080psf_2398
            SceneVideoSampleRate=RGB
            SceneVideoBits=10
            SceneVideoFrameBuffer=RGB
            SceneTimecodeFormat=LTC_NDF
            SceneTimecodeSource=INTERNAL
            SceneTimecodeMode=RECORD_RUN
            SceneTimecodeSync=SET_START
            SceneFieldFrameFlag=Not Specified
            SceneCameraType=VIPER
            SceneCameraNumber=A
            SceneNumberOfTakes=38
            SceneLastTake=44
            SceneNotes="None"
            [TAKE:41]
                TakeNumber=41
                TakeNotes="None"
                TakeTimecodeStart=00:21:20:05
                TakeTimecodeEnd=00:21:30:04
                TakeUserBits=00:00:00:00
                TakeAltTimecodeEnd=00:00:00:00
                TakeUMID=0
```

```
        TakeCircle=0
        TakeNumberOfFrames=240
    [/TAKE]
    [TAKE:42]
        TakeNumber=42
        TakeNotes="None"
        TakeTimecodeStart=00:21:30:05
        TakeTimecodeEnd=00:21:45:12
        TakeUserBits=00:00:00:00
        TakeAltTimecodeEnd=00:00:00:00
        TakeUMID=0
        TakeCircle=0
        TakeNumberOfFrames=368
    [/TAKE]
    [TAKE:43]
        TakeNumber=43
        TakeNotes="None"
        TakeTimecodeStart=00:21:45:13
        TakeTimecodeEnd=00:21:59:17
        TakeUserBits=00:00:00:00
        TakeAltTimecodeEnd=00:00:00:00
        TakeUMID=0
        TakeCircle=0
        TakeNumberOfFrames=341
    [/TAKE]
    [TAKE:44]
        TakeNumber=44
        TakeNotes="None"
        TakeTimecodeStart=00:21:59:18
        TakeTimecodeEnd=00:22:03:14
        TakeUserBits=00:00:00:00
        TakeAltTimecodeEnd=00:00:00:00
        TakeUMID=0
        TakeCircle=0
        TakeNumberOfFrames=93
    [/TAKE]
[/SCENE]
[SCENE:2]
    SceneNumber=scene-2
    SceneDate=1/25/2004
    SceneTimecodeStart=00:22:14:17
    SceneLocation=Not specified
    SceneUnit=Not specified
    SceneAudioChannels=None
    SceneAudioType=Not Specified
    SceneVideoFormat=1080psf_2398
    SceneVideoSampleRate=RGB
    SceneVideoBits=10
    SceneVideoFrameBuffer=RGB
    SceneTimecodeFormat=LTC_NDF
    SceneTimecodeSource=INTERNAL
    SceneTimecodeMode=RECORD_RUN
    SceneTimecodeSync=SET_START
    SceneFieldFrameFlag=Not Specified
    SceneCameraType=VIPER
    SceneCameraNumber=A
    SceneNumberOfTakes=2
```

```
            SceneLastTake=2
            SceneNotes="None"
            [TAKE:1]
                TakeNumber=1
                TakeNotes=1
                TakeTimecodeStart=00:22:03:15
                TakeTimecodeEnd=00:22:08:12
                TakeUserBits=00:00:00:00
                TakeAltTimecodeEnd=00:00:00:00
                TakeUMID=0
                TakeCircle=0
                TakeNumberOfFrames=118
            [/TAKE]
            [TAKE:2]
                TakeNumber=2
                TakeNotes="None"
                TakeTimecodeStart=00:22:08:13
                TakeTimecodeEnd=00:22:14:17
                TakeUserBits=00:00:00:00
                TakeAltTimecodeEnd=00:00:00:00
                TakeUMID=0
                TakeCircle=0
                TakeNumberOfFrames=149
            [/TAKE]
        [/SCENE]
    [/REEL]
[/PRODUCTION]
```

D: Software versions / manual updates

Manual Rev 9_4
Added new DFR update instructions.

Manual Rev 1.00

Changed New Production, New Reel and Scene menus. Added Auto Slate. See release notes in Appendix M

D.MAG DFR Release notes

0.7.8 –0.9.0
Engineering releases – USB support for PDA control and charging.

0.9.1 Engineering release
1. Added support for hardware sensor detection and reporting via serial/network control interface.
2. Added support for Button Box. NOTE: an additional hardware update is required for STWO button box support
3. Fixed a bug which caused takes to not be played if the 'Camera Number' field had spaces in it.
4.Added support for setting playback frame rates that are different from the recorded frame rate. This function can be invoked via the 'Set Play' menu item under the 'Set Info' menu in DMAGREMOTE.
5. Switch settings remembered through power cycles – Links, V.Squeeze, Loop Take

0.9.4 Engineering release
Added Fast Forward and Rewind at 10x speed
Added Play reverse
Play List now includes whole Scene
Enhanced EE mode
Enhanced API commands including take in out trim (in context editing) and disk defrag
Added support for Arri D20 Variframe flags for variable frame rate capture
Fixed bug in dmagremote which sets LTC_INPUT timecode under certain conditions.
Fixed bug where BVW commands did not have enough memory.

0.9.6 Engineering Release
Release Notes

Changes to the software since DFR/DMAGREMOTE 0.9.1

1. Added ability to play reverse, fast-forward and fast reverse.
2. Sony commands for jog and shuttle now work correctly.
3. Fixed a bug which caused the playback frame to get stuck at the frame rate set by the user. Setting the playback frame rate back to the "Recorded" frame rate would not occur.
4. Added preliminary support for ARRI D20 camera. D20 support should be considered experimental until further testing can be accomplished. ARRI D20 support is enabled by setting the Camera Type to 'ARRI D20' in the DMAGREMOTE 'scene info' screen.

5.Added support in the DFR software to trim take in and out points.

0.9.7 Release
Version 0.9.7

1. Fixed a bug which could potentially cause audio DMA buffer overruns at 23.98,24 and 25fps
2. Fixed a bug which caused video DMA to run slower than it should on playback. This condition existed from startup until the DFR was put into EE or record. This could cause frames to be dropped on playback at 29.97 and 30.00 frame rates

Engineering version 0.9.26

See release notes in Appendix M.

E: Travel Cases & shipping DFR

DFR Hard sided Case

The DFR is designed to be a robust, portable unit and has been tested for common carrier shipping (Fed-EX, UPS, DHL etc.) throughout the World.

The case and package was also designed to comply with personal luggage requirements on all major airlines in operation globally, again S.two has taken units as baggage throughout the USA, Asia and Europe.

The DMAG AC adapter fits into a DMAG receiver for shipping. This will protect the DMAG receiver connections. Do not place anything else in the DMAG receiver space when shipping or moving the unit. Make sure the PSU is oriented correctly and that the thumbscrews are hand tight.

D.MAG Triple magazine case

D.MAG Single hard case

F: PowerCon Power Connector / Battery Cables

Power connections on the DFR are 24V DC. The voltage is internally regulated and will accept a range of 22V DC to 36V DC. The DFR has two Neutrik 'PowerCon' connector for 24V. This allows for battery change over when in the field avoiding power cycles in a long record.

The cable connector mate is a Neutrik Powercon NAC 3 FCA screw terminal locking mating type. The L terminal is Live (+), the N terminal is Neutral (-). The center connection is not used.

External batteries can be connected using any of the DC inputs, we recommend not less than a 15aH device.

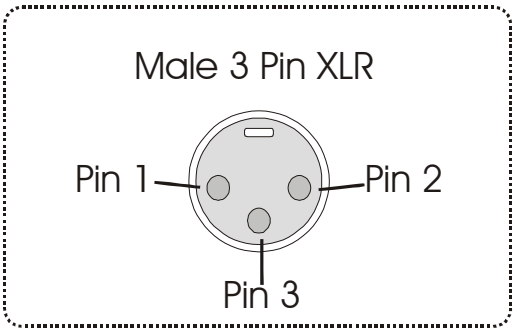
Battery cables and wiring will vary from battery suppliers so make sure that the cable you use is approved for use with the specific battery in use.

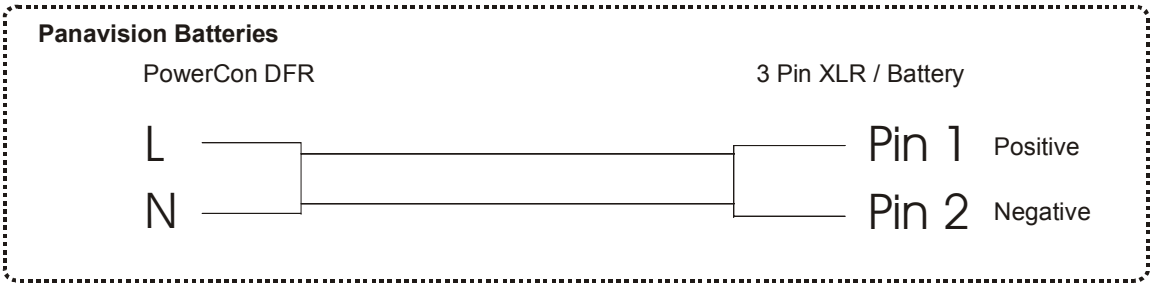
The power cable provided with the DFR and AC adapter uses heavy 14 gauge cable as the power draw is significant. When making battery cables make sure that the cable and connectors used are rated for up to 20AMP (@250V) electrical specifications.

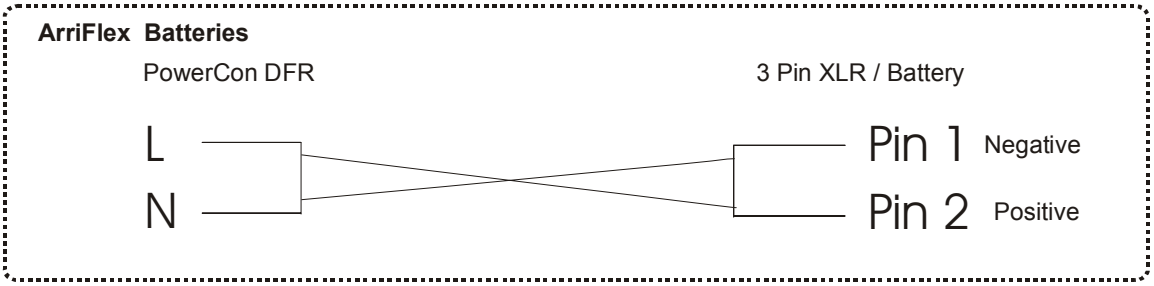
Connectors: The battery may have connectors other than Powercon. When making a specific cable make sure that power polarity is correct, damage resulting from power cable issues is NOT covered by S.two Warranty. Also make sure that the connector on the battery is rated for high amperage power circuits. DFR Battery Cables

Battery connections vary greatly from supplier to supplier. Below are details of tested 24V DC battery connections with Arriflex™ and Panavision™ style camera batteries. The DFR power range is a maximum of 36 V (nominal) DC to a minimum of 22 V DC.

3 Pin XLR are female sockets on the battery pack
requiring a male plug on the cable. Test any cable throughly before use.







Note that 4 pin XLR currently in use for 12V DC connections are NOT suitable for a 24V DC signal due to the power draw.

Batteries Tested:

Panavision box 24V DC, Arri box 24V DC House of Power 24V DC

G: Converting dpx frame numbers to timecode

The frame naming and numbering convention used in by the D.MAG system is based upon frame numbers that reflect the timecode value. The timecode value is also entered in the dpx header. If you need to derive a timecode value from the frame number the equations below allow an absolute number to be found.

1. frames per second: FPS
2. frames per minute: FPM = 60*FPS
3. frames per hour: FPH = 60*60*FPS

1. Hours = the quotient of 'frame number / FPH'
2. Minutes =the quotient of remainder of step 1 / FPM
3. Seconds = the quotient of remainder of step 2 / FPS
4. Frames = remainder of step 3.

Ex: Convert number 52305 to timecode at 24 FPS.

FPS = 24
FPM = 1440
FPH = 86400

Hours = 52305 / 86400 = 0.605. Quotient is 0, remainder is 52305.
so Hours = 0

Minutes = 52305 / 1440 = 36.3229. Quotient is 36, remainder is 465
[note: remainder = (52305 - (36 * 1440)) = 465]
Minutes = 36

Seconds = 465 / 24 = 19.375. Quotient is 19, remainder is 9
[note: remainder = (465 - (19 * 24)) = 9]
Seconds = 19

Frames = 9

So, 52305 -> 00:36:19:09 at 24FPS

PS: Use only whole numbers for FPS, (24,25,30). Using 23.98 or 29.97 requires drop-frame calculation.

This is an example of a simple spread sheet built in MS Excel by DFR user Chad Martin at The Camera House in North Hollywood, CA. The sheet is available on the S.two web site for download at: http://www.stwo-corp.com/manual/
There are two files:
http://www.stwo-corp.com/manual/FiletoTCConversion.xls
http://www.stwo-corp.com/manual/TCtodpxfileconversion.xls

This converts timecode to DPX frame numbers so that you can find a specific DPX frame from a DFR still frame. The FPS column is the taking speed, enter the hours, minutes, seconds and frames and the DPX frame number pops up. Remember to add the appropriate number of zeros to make a 7 digit number when downloading the dpx frame.

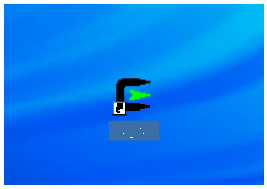
A	B	C	D	E	F	G	H	I
	fps		Hour	Minute	Second	Frame		DPX
	24		3	40	2	21		316869

The formula in the DPX header is =G3+F3*B3+E3*B3*60+D3*B3*60*60

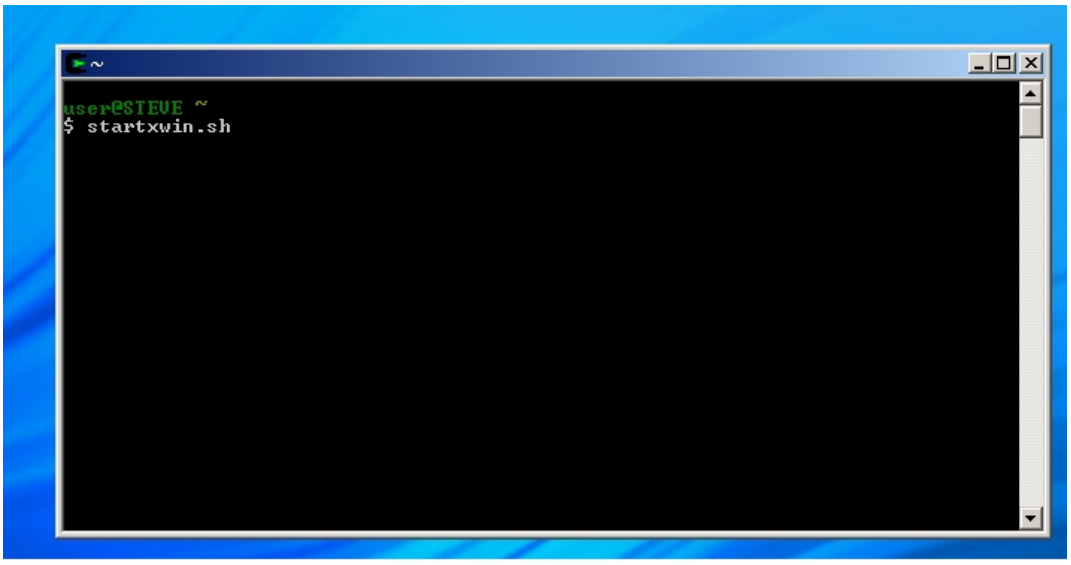
H. Running DMAGREMOTE on a PC.

Steps to follow to start and use the dmagremote program using an Xwindows server.

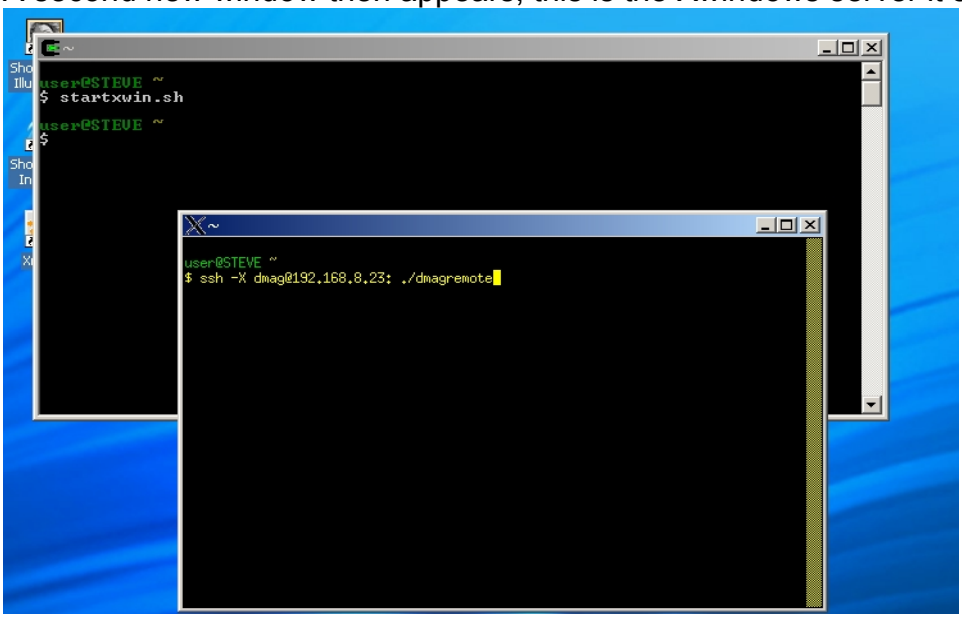
Once Cygwin is loaded onto the PC (or Xfree86 on a MAC) an icon appears on the desktop. The icon looks like this on a PC:
To load Cygwin see the min DFR manual.



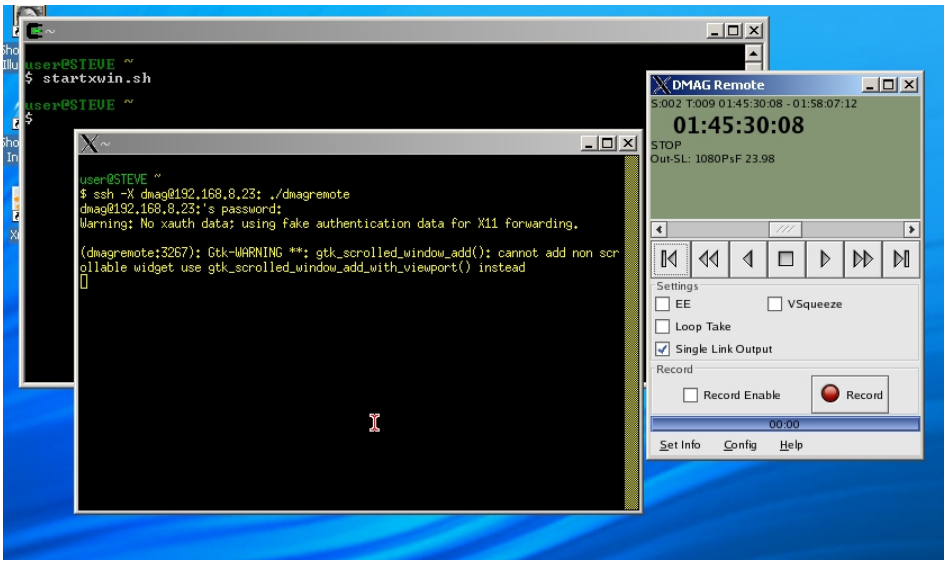
Double click the icon and a new window appears:



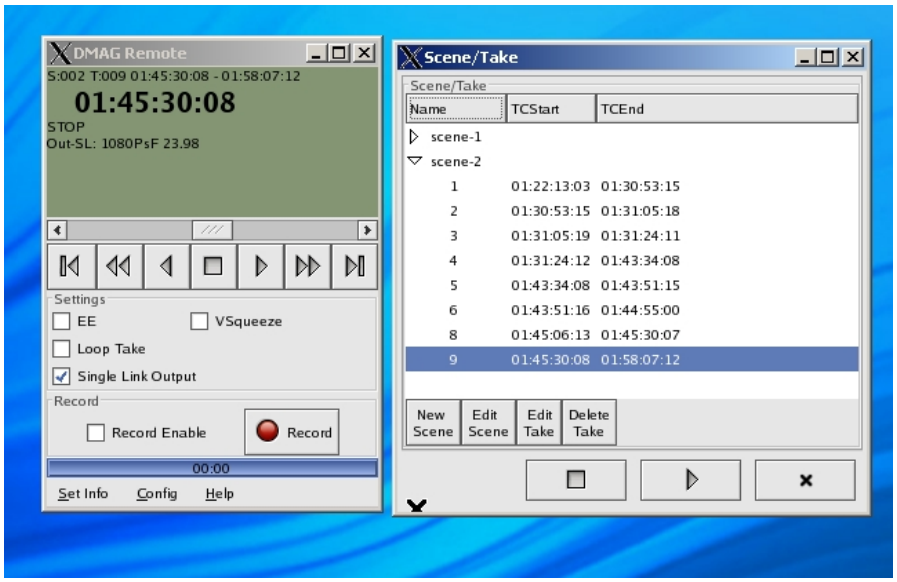
Type in startxwin.sh and hit enter
A second new window then appears, this is the Xwindows server it self



Click in this window and type
ssh –X dmag@192.168.0.52: ./dmagremote and hit enter. The command has to be precisely written, the x in the line is a capital X, all other letters are normal. The IP address is the DFR address which is on the main LCD for a static address. The address used in this line is the default static IP address set by the factory. The address shown in the example above is a DHCP address.
The window will ask for a password which is dmaguser Type this in and hit enter. Make sure that you type this in lower case. A new window will open with the dmagremote program running

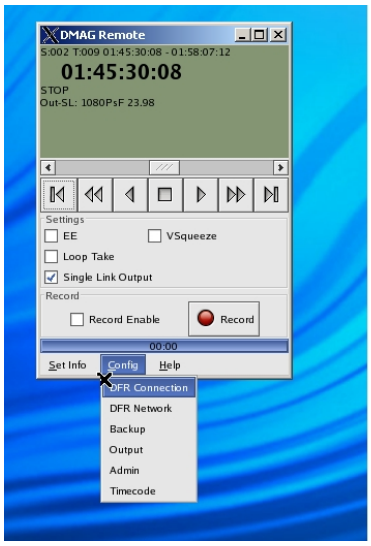


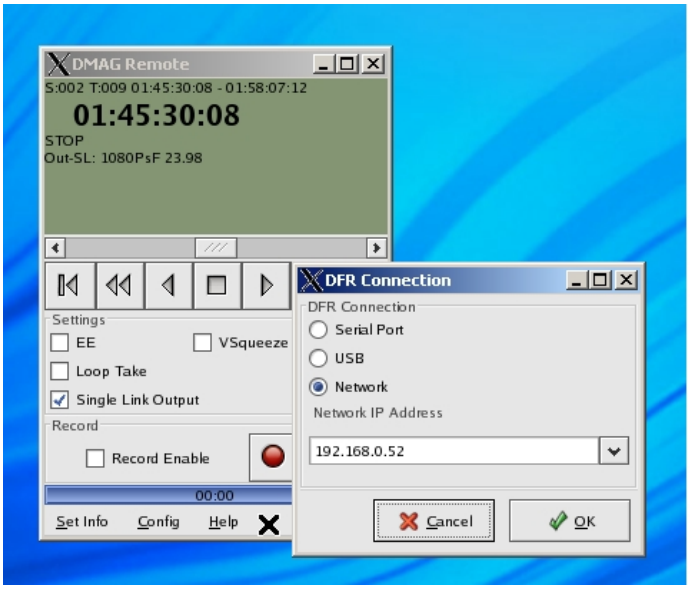
You can then minimize the two cygwin windows (but do not close them!).
The dmagremote is now running with full control of the DFR and all its functions.



Click on the main timecode window to bring up the scene/take list.

Trouble shooting
Password.
If you make a mistake the system will prompt you to re-enter up to three times. To try again use the up arrow key on the keyboard and that will re-enter the line, press enter again and the system will prompt for the password.
NO COMMS
If the dmagremote starts but shows NO COMMS or does not load in a scene take list or show he timecode then it is most likely that the dmagremote is pointing to a different ip address. To set the address use the config/dfr connection menu.
Enter the IP address on the new window that appears and click on OK.

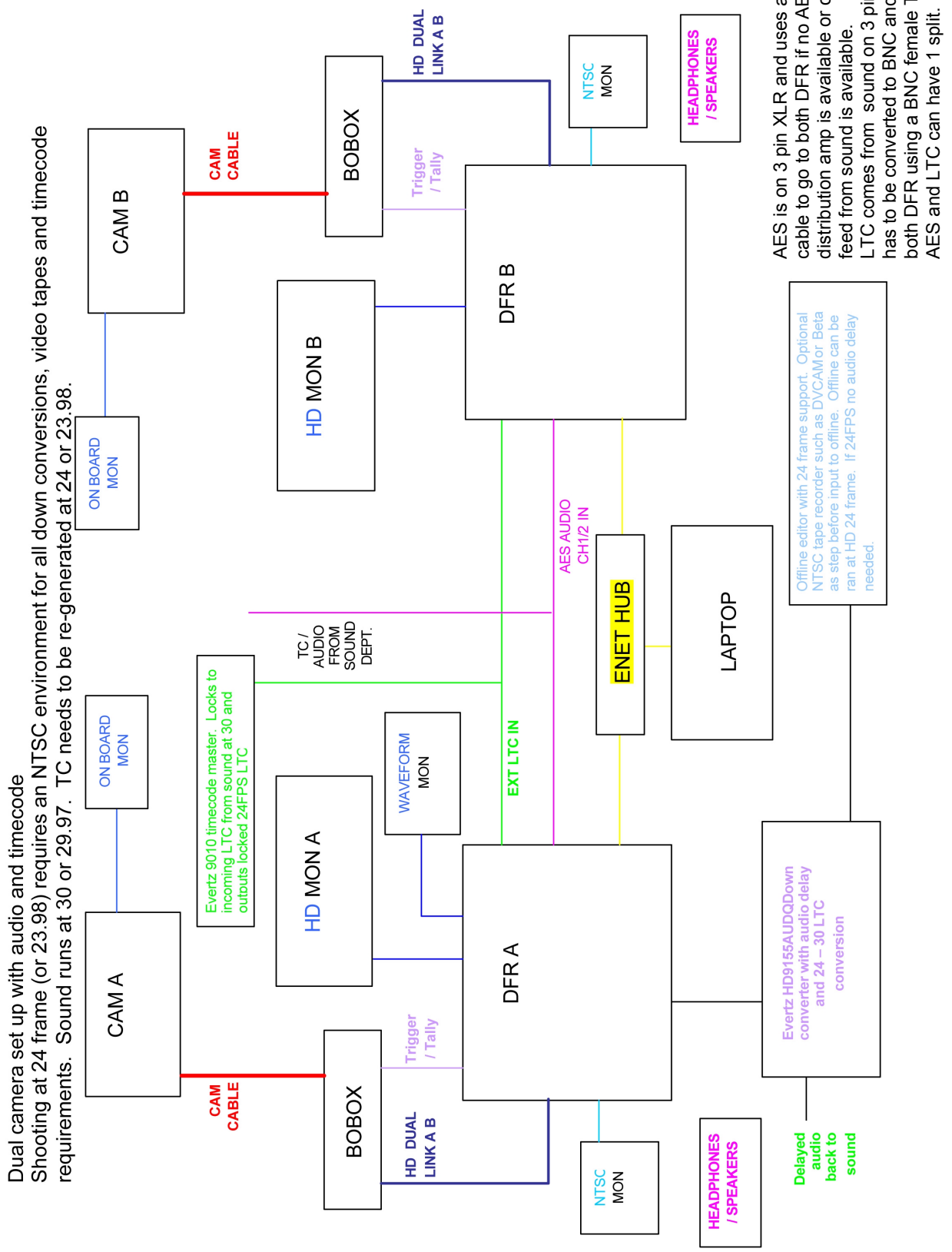




Steps to start dmagremote on PC

Click in cygwin icon.
Type startxwin.sh in new window hit enter
A new window appears Type ssh –X dmag@192.168.0.52: ./dmagremote
Type the password when prompted dmaguser hit enter
The dmagremote program will appear
Minimize the other two terminal windows

I: Dual use Network, with Audio and Sync LTC



J: Useful Third Party Software for use with D.MAG System

Most of the software listed below is available for download on the net. Some is open source but others have a charge if in commercial use with free demo downloads. Please respect the software providers rules for payment if using any software with D.MAG Systems in productions.

SSH and X windows clients

PuTTY uses windows XP OS and is available for download from the web at http://www.puttyssh.org/. This site includes access to and lists of international mirror sites. This program includes both SSH and SCP programs. (PuTTY is copyright 1997-2002 Simon Tatham. Portions copyright Robert de Bath, Joris van Rantwijk, Delian Delchev, Andreas Schultz, Jeroen Massar, Wez Furlong, Nicolas Barry, Justin Bradford, and CORE SDI S.A.).

Windows XP – CygwinX for Windows, available from http://xfree86.cygwin.com/ Tested on Windows XP Pro and XP Home editions. Versions are available for windows 2000 and NT releases.

Mac OS X XFree86 version 4.3.0 for Darwin available from http://www.xfree86.org/ Tested on OSX 10.2.8 – Jaguar OS.X requires that a version of Darwin is already loaded in order to run successfully. The version we have used was found at: http://prdownloads.sourceforge.net/xonx/XFree86_4.3.0.dmg?download

A Windows drag and drop ssh file transfer client is available at http://www.ssh.com/ This allows the user to configure SSH clients for browsing and transferring files to and from D.MAG system products. SSH Secure Shell 3.2.9 Copyright (c) 2000-2003 SSH Communications Security Corp. This software is an evaluation version and needs to be purchased to use in production.

DPX File Viewers

Xnview have a free viewer available for windows, Linux and BSD platforms, available from http://www.xnview.com/

GraphicConverter is available for MAC OS from http:\\www.lemkesoft.com with support from at least V4.4 and MAC OS 8.x onward.

In addition there are many other viewers for DPX frames, in general any program with Cineon (.cin) support will be able to load and use DPX frames also.

K. S.two Programming Interface – API

S.two has the complete API for the DFR now available. This details all the command and control interfaces and language that is used for all aspects of the DFR. Please contact S.two for further details.

THE API details commands used with RS232, RS422 and Ethernet control interfaces and provides a basis for user programmed interfaces.

L. DFR LCP PLUG

The DFR LCP has a new plug that replaces the optional IEEE1394 found on the DFR connection panel below Ethernet #1. The cable (supplied) is a 9 pin D-SUB on the DFR LCP end and a collared quick connect push pull 12 pin connector.

M. Software Release Notes

DFR and DMAGREMOTE Version 0.9.26 Release Notes

Abstract

This paper documents changes made to the DFR and DMAGREMOTE software packages.

Table of Contents
Changes
Installation

Changes

This section lists changes made to the DFR and DMAGREMOTE software packages up to version 0.9.14.

DFR-0.9.26 - 7 Oct 2005

This release contains bug fixes and enhancements to DFR and DMAGREMOTE software added since DFR/DMAGREMOTE version 0.9.14.

* Added Autoslate system.
* External LTC offset adjustment.
* Enhanced transport control.

Autoslate

The autoslate system will place a generated "slate" image into a user selectable number of frames at the beginning of each take. Also, a single image containing all MetaData is placed onto the last frame of each take. Both the front slate and end slate functions can be individually enabled or disabled.

Until the autoslate functions can be integrated into DMAGREMOTE, control of the autoslate function is managed through the configuration file found in the directory /home/dmag/.properties

The relevant entries in this file are:

```
eslate.end.enable=true
eslate.front.count=5
```

eslate.front.enable=true

eslate.end.enable
when set to true will cause the endslate to be written. When set to false will disable the endslate function

eslate.front.count
sets the number of frontslate images to be written to the beginning of each take.

eslate.front.enable
when set to true, enables front slate function. When set to false, disables front slate function

---

External LTC offset adjustment

This value allows the user to select an adjustment to the external LTC value received for each frame during record. The received timecode will have the adjustment value added it. LTC adjustment is changed by editing the file /home/dmag/.properties

The relevant entry is:
ltc.offset=##

where ## is a number ranging from -10 to +10

Changing the /home/dmag/.properties file

The properties file is read by the DFR whenever a DMAG is loaded. The recommended procedure for changing the .properties file is as follows:

1. Unload DMAG
2. Login to DFR and edit .properties file
3. Load DMAG

DFR-0.9.15-0.9.25

DFR/DMAGREMOTE versions in this range were not generally released.

DFR-0.9.14 - 28 July 2005

This release fixes bugs found found in DFR and DMAGREMOTE version 0.9.13

DFR hang when switching scenes using DMAGREMOTE and timecode would read 00:00:00:00

Fixed

Deleted wrong take. Renaming Take doesn't always rename the right take.

Interacting with the scene or take dialog boxes in conjunction with selecting scenes or takes while in the process of manipulating scene or take info could sometimes cause a mismatch between the scene and take database on the DFR and DMAGREMOTE.

Now, whenever either the scene or take info dialog boxes are displayed, the rest of DMAGREMOTE screens are inactive. The user must dismiss the scene or take info dialog box before being able to select another scene or take.

Take info dialog box pops up at the end of record even when record started by external means.

The take info dialog will now automatically pop up at the end of a record only if the record was initiated by DMAGREMOTE.

DFR-0.9.13 - 11 July 2005

This release fixes bugs found found in DFR version 0.9.12B1.

Selecting New Reel would not erase DMAG files.

This bug left existing directories and frame files on the DMAG, but erased the dmaginfo.txt file.

Dangling Scene

This problem was caused when a new scene is created, but the DMAG unloaded before any takes are recorded to the scene. On reloading the DMAG, the DFR software would hang while trying to process the empty scene.

DFR-0.9.12B1 - 15 June 2005

Directory and File naming changes

In order to provide a better mapping between user defined Meta-Data information and material recorded on the D.MAG, directory and file names are now derived from the Reel Name, Scene Name and Take Name Meta-data fields.

When the user changes the Reel Name, Scene Name or Take Name Meta-data fields, the corresponding scene and take directories and DPX file names are changed as well.

The user is free to specify any name for these fields, but not all characters are valid for the directory and file names. Therefore, when creating the directory and file names, the name specified by the user is mapped to a valid directory and file name

---

Meta-Data to path name mapping

All upper and lower case characters and numbers are maintained. Space characters are converted to '_'. Any other punctuation characters are discarded. For example, if the user set the Reel Name to 'R1', Scene Name to 'SCN 1A/1B' and the Take Name to 'TK 1A/1', the corresponding path name to the dpx files would be:

SCN_1A1B/TK_1A1/R1_SCN_1A1B_TK_1A1_camA_#######.dpx

The '#######' part of the file name is the timecode value for the frame, converted to a frame number.

Default values

The default Meta-data for Reel Name, Scene Name and Take Name

are 'reel-#', 'scene-#' and 'take-#' where '#' is an auto-incrementing value.

Backward Compatibility

Any D.MAG loaded into the DFR that contains material recorded with prior versions of the DFR software will continue to use the path naming convention that exists on that D.MAG. The new path naming scheme will not be used until a 'New Production' is done.

DPX Header changes

* Undefined floating point values are now correctly set.
* Filename is now inserted into the file_info header. DPX headers are updated when Reel Name, Scene Name or Take Name Meta-data fields are updated.

File Preallocation

The DFR now uses file preallocation which allows the DFR to record frames more efficiently and enable longer record times for 30fps material. File Preallocation is done whenever a 'New Production' is created. File Preallocation takes around 10-30 seconds to complete depending on D.MAG capacity.

Any D.MAG loaded into the DFR which contains material that was recorded with a prior version of the software will not use the file preallocation scheme.

When recording, new frames are recorded into the preallocated files. When recording is stopped, filenames are created within the scene/take directories.

Recover from power loss during record

If there is a system crash, or loss of power during record. All frames recorded up to the point of failure are automatically recovered from the preallocated files when the system is restarted, or when the D.MAG is loaded. DO NOT place the D.MAG into a DFR running an older version of DFR software, or data loss could occur.

File recovery occurs at around 250 frames per second, so it can take a couple of minutes to recover depending on the number of frames to recover.

Until the files are recovered, there will be no files listed under the scene/take directory.

Single Link output during EE/Record

The DFR's color correction tables and 'Squeeze' modes are now operational while the system is in EE or record.

DMAGREMOTE

When 'New Production' or 'New Reel' are selected, the user is prompted to enter Meta-data for Reel and Scene information. The 'Take Info' box will also pop up at the end of each record to prompt the user to enter enter a Take Name. If the user chooses to use the default values, either pressing the OK or Cancel buttons will cause the defaults to be used.

The DMAGREMOTE will popup a 'Progress' box whenever Meta-data updates cause DPX headers to be updated. DPX header updates operate at around 250 frames per second.

Installation

Prerequisites

1. To install the DFR software, you will need to access the DFR via it's Ethernet interface using secure shell (ssh) and secure copy (scp)
2. The factory default IP address for the DFR is 192.168.0.52.
3. The password is dmaguser
4. The GraphicsMagick package must be installed prior to installation of DFR version 0.9.26. The GraphicsMagick package must be installed. The GraphicsMagick package can be found here

If installing ipaq software, the following is required:

1. IPAQ
2. IPAQ USB cable

Procedure

Install Graphics Magick

1. Copy the file GraphicsMagick-1.2.020050828-1.i386.rpm to the DFR's /tmp directory.
2. Login to the DFR
3. Enter the command:

```
rpm -Uvh GraphicsMagick-1.2.020050828-1.i386.rpm
```

Continue with installation of DFR 0.9.26 below

The installation files are contained in the file install_0913.zip. This is a compressed file that contains the installation script.

Transfer the file install_0913.zip to the DFR using the scp command:

```
scp install_0926.zip root@192.168.0.52:/tmp
```

Login to the DFR using ssh and change directories to the /tmp directory:

```
ssh root@192.168.0.52
cd /tmp
```

Unzip the file

```
unzip install_0926.zip
```

Install the files by executing the install script

```
sh ./install_0926.sh
```

You will see the following output

```
Verifying archive integrity... All good.
Uncompressing DFR/DMAGREMOTE 0.9.26.....
Checking current install
Installing libraries
Creating backup of /home/dmag -> /tmp/dmag-pre0926-backup.tgz
Installing DFR version 0.9.26
Stopping dmag.exe
Shutting down NFS mountd: [ OK ]
Shutting down NFS daemon: [ OK ]
```

Shutting down NFS quotas: [OK]
Shutting down NFS services: [OK]
Starting NFS services: [OK]
Starting NFS quotas: [OK]
Starting NFS daemon: [OK]
Starting NFS mountd: [OK]
Installing DMAGREMOTE version 0.9.26
Installation Complete.
Installation Log is located in /tmp/install_0926.log
**** Check installation log ****

Install IPAQ software

Note: If you have any trouble with these procedures, please call STWO customer support for assistance

When the system boots up, login to the DFR as the root user:
ssh root@192.168.0.52

Change directories:
cd /home/dmag/ipaq

Plug the IPAQ into the USB port

Copy the install file to the IPAQ using scp
scp dmagremote_0.9.13_arm.ipk root@192.168.8.202:/tmp

Next, login to the IPAQ using ssh
ssh root@192.168.8.202
password: dmag

Change directories
cd /tmp

Install the IPAQ software - which takes a couple of minutes
ipkg install dmagremote_0.9.13_arm.ipk

If you get an error message indicating that the package has already been installed, use the following command:
ipkg install -force-overwrite dmagremote_0.9.13_arm.ipk