

# NAGRA SUPPORT

Daniel Technology produces a line of support accessories for the Nagra\* model SN, SNS, SNST, and JBR recorders. They are in each case either direct or functional replacements for the equivalent Nagra model.

NT-230 Tape for all SN (2 hr.30 min.)(green)	NLS-2/SFA	Remote start/stop for SN
NTP-230 100 pc. bulk pack on plastic reels	LS-1/SFA	Latching remote control for SN
NT-310 Tape for all SN (3 hr.10 min.)(blue)	NLS-2/MFA	Remote start/stop for JBR
NTP-310 100 pc. bulk pack on plastic reels	LS-1/MFA	Latching remote control for JBR
RL-4 Empty reel for all SN recorders	EX-5	Expander/monitor for SNST recorder
JT-200 Tape for JBR recorder (2 hrs.)	LIST	Line input for SNST recorder
JT-130 Tape for JBR recorder (1 hr.30 min.)	LIJ	Line input for JBR recorder
EM-8/SFM Microphone for SNS	PDS	Power supply for DSP
EM-8/STFM Microphone for SNST	PSN	Power supply for all SN recorders
EM-8/MFM Microphone for JBR	SEQ-13	Sequencer runs recorders in tandem

# NAGRA SERVICE

Daniel Technology is a full service repair shop for Nagra security and law enforcement products. Our staff has over forty man-years of experience with Nagra recorders. They are factory trained by the manufacturer Kudelski, Sa. and equipped with the finest test instruments available. While our hourly rate is not the cheapest, the efficiency and thoroughness of our technicians makes the final cost of repair very economical. All work is performed to the highest factory standards assuring absolute reliability. Daniel Technology has developed numerous improvements to the Nagra recorders which address the performance and reliability issues of these machines. In addition to general repair and calibration, we offer the following unique capabilities:

## FOR SNS & SNST

**MOTOR REPAIR** - The SNS and SNST motors can be repaired at about half the price of a factory rebuild. This service can be performed on virtually all defective motors which we encounter. Performance and reliability have been proven with over 250 repaired units currently in use.

**HEAD LAPPING** - Daniel Technology has developed proprietary fixtures for refurbishing Nagra SNS and SNST record and play heads with a degree of accuracy equal to new heads. All other shops in the U.S. lap by hand which is not as accurate or reliable and cannot assure original factory performance. The cost of new heads along with the necessary calibration time is four to five times the cost of high precision refurbishing.

**ERASE UPDATE** - The current erase head supplied by Kudelski is based on a design developed by Daniel Technology. This improved contour offers significant performance advantage over the older shape. Because Daniel Technology also designed and built special fixtures to recontour the older heads, we can provide the update at one third the price of installing a new erase head along with the necessary calibration.

**SWITCH LOCK** - A small captive thumb screw is installed to provide a positive lock in the "ON" position of the control lever. This is more reliable than placing tape over the lever.

## FOR JBR & PS-1

**GEAR COVER MOD** - The JBR gear cover (black insert on deck) is extremely thin and only secured by three screws. Often the corner by the tension roller lifts, allowing the tension linkage to become misaligned. Daniel Technology modifies the machine and installs a very flat miniature screw in the corner to eliminate this problem.

**JBR FAST FORWARD** - By modifying the fourth connector and providing a special keyed jumper plug the JBR can be operated at four times normal speed while record is disabled. This allows the operator to fast wind to the end leader without extraneous recording, thereby facilitating the safe removal of tape from the machine.

**PS-1 REINFORCEMENT** - Several weaknesses in construction of the PS-1 have caused damage in shipping. For machines which will be frequently shipped, we can install a support rib underneath the deck to prevent the top panel from bending. Also, a large capacitor in the power supply is secured to prevent it from tearing itself from the board.

**SOFTWARE UPDATE** - Prior to version 2.2 software the PS-1 would often destroy tapes if a glitch occurred in the servo. Kudelski originally tried to fix the problem with mechanical modifications which are expensive and only partially successful. Installation of current software and proper servo calibration are all that is needed and can be done at modest cost.

**Daniel Technology, Inc.**  
www.danieltechnology.com

26 Pearl St. Suite 202  
Norwalk, CT 06850  
Phone (888) 412-7879  
FAX (203) 847-2820

# NT-310

The **NT-310** is a full three hours and ten minutes of tape loaded on an **RL-4** precision metal reel for the Nagra SNST and SNS recorders. All metal construction provides strength and stability not found in any plastic or hybrid reel. The tape is carefully selected and tested for best performance on Nagra recorders before it is loaded onto the **RL-4** reels in a clean environment with custom made winding machines. Quality control is similar to "mil spec" and aero-space production. All components and equipment are accountable and can be traced through the serial number on every reel of tape. Each reel is individually serial numbered for control of production as well as providing convenient case records for the end user.

Because all recordings should be made on fresh tape, the **NT-310** is supplied in individual packages which in addition to the serial number also have the date when the tape was loaded. This assures the customer that he is getting fresh tape and can help with rotating inventory. Daniel Technology recommends using tape within about one year of manufacture. **NT-310** tapes provide extra reliability and value for the most critical recordings.

The **NTP-310** is supplied on high strength plastic reels in packages of one-hundred tapes for those applications where economy is essential. For shorter recordings the **NT-230** and **NTP-230** two and one-half hour tapes are also available.

# JT-200

The **JT-200** cassette for the Nagra model JBR recorder is a third generation device which was developed specifically to correct the original design problems by the manufacturer of the recorder. Inherent reliability was the principal objective developing the **JT-200**. However, in conducting the research to produce a new cassette Daniel Technology found that when the cassette functions reliably it also is mechanically quieter and smoother in operation. Furthermore, the magnetic performance was enhanced by improving tape to head contact and minimizing wow & flutter and tape skew. The improved guidance system inside the **JT-200** significantly reduces tape wear and edge damage caused by repeated playing in earlier cassettes. There are no sharp edges or projections which in the past have snagged or damaged tape. The possibility of tape jamming which occurred frequently in the older cassettes is also reduced. Any static charge is dissipated by the use of conductive materials

While substantial improvements in performance and reliability are the primary characteristics of the **JT-200** it should be noted that the product is very attractively priced because of simplicity of assembly and a small parts count.

For those who want an even more rugged tape for the JBR and can operate with a shorter running time, there is the **JT-130** cassette which runs for 1 hour 30 minutes. Because it uses thicker tape there is less chance of damage from rough handling or improper function of either the record or playback machine. The **JT-130** provides the ultimate in reliability with the JBR recorder.

# SENSIBLE POWER

Nagra SNS or SNST tape recorders and the DSP monitor are very efficient devices for battery operation in the field, but when used to copy and transcribe tapes or play them in court replacing batteries is a real inconvenience and expense. Now there is a practical and affordable alternative.

The **PSN** is a regulated and filtered power supply which provides clean power to either the SNS or SNST recorder. It is a wall-plug style unit with a six foot cable and connector which is attached to the recorder. When connected to the Nagra, the **PSN** automatically bypasses the batteries thereby avoiding any concern about how the machine is powered.

The **PDS** is a wall-plug power supply which is filtered and stabilized for reliable operation of the Nagra DSP monitor. This prevents the distortion caused by weak batteries. The price of this unit includes installation of a convenient connector in the DSP which eliminates the need to remove the battery cover. The batteries may be left installed and ready for field operation.

Both the **PSN** and **PDS** are designed to keep the power transformer away from the audio equipment, thereby removing any hum field. This also will allow the equipment to sit properly without risk of tipping over. These units are top quality economical power supplies.

## EM-8

The **EM-8** is a versatile high output, low noise electret microphone. Because of its small size, it is easily concealed on the body. A unique custom-made beige cable which is very strong yet flexible provides easy handling and long term durability. A black cable is also available. The **EM-8** is internally shock mounted in a neoprene suspension to minimize clothing noise. This suspension extends through the housing providing direct acoustic coupling without any cavity resonance. The suspension also provides protection against damage if the microphone is dropped or struck.

The **EM-8** can be used with either the Nagra SNS, SNST, or JBR recorders and is designed to function in the severe environment on the human body. The quality built into each unit is backed by the Daniel Technology reputation for innovation and dependability.

## LS-1

### Latching Switch

The **LS-1** was developed by Daniel Technology in response to the needs of law enforcement officers who must install recorders on non-departmental personnel. In this situation a compromise was sought between delaying the start-up of the equipment to conserve tape and batteries or risking the integrity of evidence. The **LS-1** provides the ability to delay starting the equipment, but once the switch is activated it can only be turned off and reset by use of a special tool. Through a careful attention to detail Daniel Technology designed into the **LS-1** many features which make it a flexible and reliable tool for a wide range of law enforcement technical operations.

# EX-5

## Dynamic Expander

There are a wide variety of uses for the EX-5 including playback of tapes made with the Nagra SNST as well as those made on any other recorder using a 2:1 compressor. It is a precision circuit which will restore the full dynamic range of compressed signals. There are two audio channels for stereo recordings. When used with the SNST the EX-5 provides a more compact and convenient alternative to the Nagra DSP. There is a built-in high pass filter which eliminates hum, wind noise, and synchronizing tones for use with film and video cameras. This allows the EX-5 to track very accurately under difficult conditions. It is also much more economical than the DSP to purchase and operate.

The EX-5 has two types of output connectors. The LINE OUTPUT jacks on the rear panel have a fixed signal of "0" dBm at full level and a maximum before clipping of +6 dB. They should normally be used for making tape copies and other situations where the highest quality reproduction is required. Because of the very wide dynamic range produced by the EX-5 it may sometimes be necessary to adjust the output level and this can be done by using the volume controls to adjust the output at the PHONES/SPKR jack on the front panel. It is designed for headphones or small loudspeakers such as those used with personal (Walkman) tape players, but may also be used for making tape copies. Although any headphones may be used, Daniel Technology can supply several types which are perfectly matched to the EX-5. Unlike other units which have a single internal loudspeaker, the external loudspeakers provide full stereo sound for best voice intelligibility.

The EX-5 is compact and very easy to operate. A WARNING light serves two functions. As an overload indicator, it is on whenever either channel is within 3 dB of clipping and will follow the peaks of the sound. As a low battery indicator, it blinks once every second when the battery should be replaced.

Power is provided by either a single standard 9-volt battery or an inexpensive wall-plug power supply which automatically disconnects the battery when plugged into the unit.

### SPECIFICATIONS

Expander ratio	1:2	Phone/Speaker output	10 $\Omega$ 1.5 volts RMS
Expansion range	25 dB*		any load impedance (protected)
Frequency response	150 Hz to 8 kHz $\pm$ 1 dB -20 dB @ 60 Hz	Power supply	6 to 15 volts DC <100 mA
Dynamic range	line output \$90 dB phones output \$80 dB	Battery	rectangular 9V (MN1604 or equal) 10 to 40 hours depending on load 25 to 80 hours with lithium battery
Distortion	<1.0% THD @ 0 dBm	Indicators	single LED - peak responding either channel within 3 dB of clipping flashing when supply voltage is low
Channel separation	line output \$90 dB phones output \$60 dB	Dimensions	4 W x 4 D x 1 1/2 H inch
Input	selected by input cable minimum 150 millivolts RMS		
Line output	1.5 volts RMS (+6 dBm)		

\* May be extended to 40 dB expansion for special applications

**Daniel Technology, Inc.**  
www.danieltechnology.com

26 Pearl St. Suite 202  
Norwalk, CT 06850  
Phone (888) 412-7879  
FAX (203) 847-2820