> **"Always do right. This will gratify some people and astonish the rest"**
> **- Mark Twain**

Gilderfluke & Co.
ROBOTICS & SOUND SYSTEMS
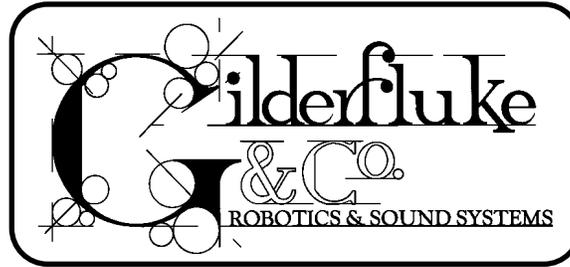
> **All the News that we could jam into a little under 8 pages**

Views and News from the world of Gilderfluke & Co., Inc.

Eight Bit Audio Compressor

The only option we had when we introduced or popular Eight Bit line of Digital Audio Repeaters was to build our own audio sampling hardware/software package. Because of its cost, only our largest users did their own audio sampling. Most others sent us the material they wanted burned into their AB-50, DR-50 and AB-100 repeaters.

Our AB/DR-3000 series of sixteen bit audio repeaters were developed more recently. We wanted to avoid the cost and limitation of developing our own hardware and
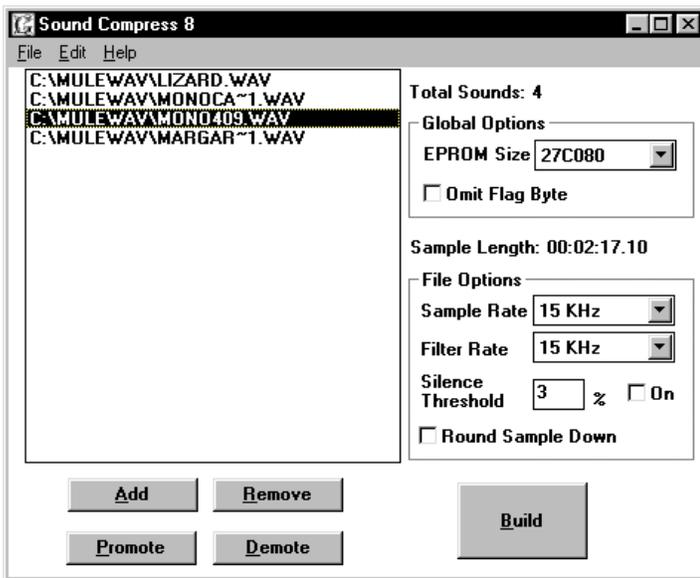
software again now that there was so much available on both PCs and Macintoshes. A simple free PC utility that translates standard audio files into the format needed by these repeaters was our solution. Many more of our AB/DR-3000 customers program their audio themselves.

We have now released a **FREE Eight Bit Audio Compression Utility** for our eight bit repeaters. It lets you take any .WAV (for PCs) or AIFF (for Macintoshes) audio file and turn it into a file that can then be programmed into an

Gilderfluke & Co., Inc.

As of July 1, 1997, Gilderfluke & Company will be known as Gilderfluke & Co., Incorporated. What does this mean to you? Nothing. We will be doing business at the exact same location and in the exact same way. Our growth in popularity is the only reason for this small change.

New Encoder Console

This is the first of two new animation programming consoles available for the popular PC·MACs animation control system. This console was designed specifically for Motion Base and Movie Camera Automation applications, although it can be used in many other applications as well.

Not actually a programming console, but a console 'front end', the Encoder Console allows you to attach either eight incremental encoders or eight analog voltage inputs for use during programming. PC·MACs can then record whatever movements are made on these eight inputs in Real Time. Because it is a 'soft console' these inputs can be instantly reassigned to other functions so that up to 256 analog axis can be programmed, eight (or less) axis at a time. Any previously programmed axis are 'played back' as new axis are programmed.

When used with the eight encoder inputs, the Encoder

New 'Custom' Console

Our second new Programming Console for PC·MACs Animation Control Systems is the 'Custom' Console. Like the new Encoder Console, the Custom Console is a programming console 'front end'. It is used to interface your analog and digital signals into a PC·MACs system.

Custom Console for Digital/Analog Inputs to PC·MACs

Using custom consoles, hundreds of analog and digital channels of data can be programmed at one time. New commands in PC·MACs allow you to set up any number of inputs as active for programming while all other channels stay in playback. You can create and retrieve 'Console Presets' just as you do when using any of our other

Teach PC·MACs New Tricks (like how to speak MIDI)

PC·MACs is the best selling Animation Programming System in the world. It is used by virtually all the major animated figure manufacturers for the majority of shows they produce.

To increase PC·MAC's flexibility, we have added a way for end users to modify the animation data as it passes through. Applications where you might want to do this include:

- Motion bases where the standard roll/pitch/yaw axis data may need to be translated into the positions of as many as six actuators.

- Puppeteering where one movement may affect more than one actuator. An example of this is where you want the command that opens the mouth to automatically move the jaw, lips, and cheeks.

- Where, for safety or other reasons, the position of one axis affects the position on another. An example of this is where a stage moves out from behind a curtain. The curtain can be set to automatically rise when the stage has been commanded out beyond a certain point.

- Rerouting the data from PC·MACs to another output device. Typically this would be used to send data out through the MIDI or Ethernet ports on your PC.

The way programs running under Windows access external programs are through what are called 'Dynamic Linked Libraries' (or 'DLLs' for short). The new releases of PC·MACs include four such DLLs. They can be modified by you to do whatever special tasks you need to have done. We can also modify them for you for a one time Non-Recurring Engineering (NRE) charge.

The first DLL is called before data is sent to the programming console for modification. The second is called after the Programming Console returns the modified data but before it is written to the hard disk. These DLLs can be used to mix animation channels as needed when the modified data is to be saved to the actual show data file. When you edit your animation on the OffLine screen, the data that will appear has already been modified by these DLLs.

The third DLL is the most commonly used one. It is called after the data has been saved to the disk, and right before it is sent to the outputs. This DLL is used if you want to modify the stored data before sending it to the real world. Examples of this would be to reroute the data to some other form of output like the MIDI or Ethernet ports on your PC. When you edit movements OffLine, it will appear exactly as entered. In Motion Base applications, this means that you will continue to edit the data in roll/pitch/yaw formats.

The fourth and final DLL is usually a duplicate of the third DLL. It is called as PC·MACs is writing data to Eprom files. It is used so that any modifications DLL #3 performed on the data will also appear in the final Eprom images.

Gilder WEB Page

Our World Wide Web page continues to be astonishingly popular. The number of download 'hits' we are receiving surpasses our wildest expectations.

Price lists, Manuals, Cut Sheets and even these newsletters are available 24 hours a day, seven days a week from anywhere in the world at:

http://www.gilderfluke.com

DMX & MIDI Output Smart Brick

Our Analog Output Smart Bricks (BS-ANA) have been used in hundreds of applications since we introduced them. A surprising number of these installations don't even use the analog outputs from the Smart Brick. They just use the DMX-512 outputs that are included on them.

Not being ones to ignore the obvious, we are introducing a new Analog Output Smart Brick that doesn't have any analog outputs on it. The BS-DMX-Tx can transmit up to 256 channels of DMX-512 data from its eight onboard Eprom sockets. If this is not enough, then a memory expansion card can add another seven Eprom sockets. If more channels of control are needed, then multiple BS-DMXs can be used.

An option on the BS-DMX-Tx adds a faster processor, more memory and a second serial port. This turns it into a BS-MIDI-Tx. This card can be used to transmit strings at normal serial port rates, or the rate used by MIDI. Although MIDI is too slow and not reliable enough for doing any serious animation, there is a great deal of amateur level audio equipment which it can control.

Two modes of operation are available. The first allows you to enter a number of strings that can be sent out a RS-422 or MIDI port. This is much like the Start and Stop strings found in our Smart Brick Brains.

BS-DMX-Tx The second mode of operation allows one eight bit wide data channel to be dedicated to the source for the serial data. Any data programmed into this channel will be stored until a zero value is found in the channel. The stored serial data will then be transmitted.

PCMCIA & Memory Expansion for Smart Bricks

Two new memory expansion boards increase the capacity of each BS-ANA, BS-EFB, BS-DMX-Tx or BS-MIDI-Tx by either eight 27C080 Eproms or one PCMCIA Flash Memory Card. Eight Eproms give a BS-ANA with sixteen analogs a capacity of almost five hours at 30 FPS.

Currently this option can only be installed at the factory. In the future we will support field upgrades too.

Brick Card Cages

Most of our card cage mounted 'Bricks' now use DMX-512 or a serial port in one way or another. All of our backplanes now feature both DMX-512 and RS-422 serial port connectors. Most of our cards that can take advantage of these connections are now being built with them, or will be as soon as current stocks are depleted.

Additional silkscreening and labels have also been added to all of our card cages to aid in field wiring.

'Program in Place' Universal Bricks Eliminate Eproms

The BR-UNIV is a new 32 digital output Brick card. Unique among our Animation 'Bricks' this new card can be used as either a Smart Brick or a Dumb Brick with just the flick of a switch. When programming, it can be put into a 'record' mode where it will remember all the show data it receives through the DMX-512 input. Data is stored in a nonvolatile 'Flash' memory chip. The standard capacity is about seventy minutes at 30 FPS. Future memory chips will allow this to be doubled or quadrupled.

When used as a Dumb Brick, the starts and stops for multiple shows are automatically recorded, or can be manually set.

This 'Program in Place' technology will migrate into other Gilderfluke & Company products in the near future.

Universal Bricks work as Smart *or* Dumb Bricks

Programming Consoles.

Custom Consoles are available in a variety of flavors with 128 to 256 digital or 64 to 128 analog inputs. Multiple Custom Consoles can be stacked to give you combinations of analog and/or digital inputs for up to 256 eight bit channels of programming at one time. Each Custom Console comes in a 1-3/4" (1U) tall 19" rack mounted aluminum box.

The analog inputs to a Custom console can be configured for 0-5, 0-10, +/- 5 or +/- 10 volts. They are protected from over voltages of up to 35 volts. Resolutions supported are either eight or twelve bits. The digital inputs are configured to support switch closures as their inputs.

Each Custom Console has a two line by forty character display that shows the current configuration number and the values of sixteen of the channels being controlled. Switches on the front allow you to select which configuration is being used and what data channels are being displayed.

A second use for the Custom Consoles is as a source of DMX-512 compatible data. Up to 256 channels worth of data are output by the Custom Console based on the analog and digital inputs attached to it. This allows you to run hundreds of analog and digital signals through a single twisted pair of wire to light dimmers, RTU/FSK units, Analog Output Smart Bricks, AB/DR-3000s, or any other DMX-512 compatible devices.

Eprom using any third party Eprom programmer. These can then be used in any AB-50, DR-50 or AB-100.

This new utility is so simple that it only has three basic commands: You can add an audio file to the list of sounds to go into a repeater, you can remove one of the sounds, or you can tell the utility to go ahead and compress them. Once the utility has chewed on your audio files for a while, it will leave 'Eprom' sized files on your disk ready to be programmed into your chips.

The Eprom burner we recommend for most users is also one of the cheapest and fastest ones available. This is the ROM-MAX from EE-Tools (408/734-8184). It is available from a number of different sources (including us) for about $160. The same Eprom Programmer can be used with any of our Animation Control Systems too.

Eproms for use in our repeaters are available from a number of different sources. Your cost should be about $15 to $20 for a 27C080 Eprom. Smaller Eproms will cost somewhat less. These Eproms are also available from us at a higher cost (we aren't an Eprom distributor).

Our free Eight Bit Audio Compression utility can also be used to program 360 System's and some other eight bit repeaters. All you need to do is prefilter the audio, turn off our flag bytes, and manually add in theirs.

Revamped Servo Controller

Model Airplane-Style Servo Motors are typically used for an inexpensive way to animate small figures in movies or other short life span applications. Our Sixteen Channel Servo Motor Controller has been used in major productions including Jurassic Park, Child's Play, Aliens III, and HBO's Tales From the Crypt.

New SER-16 Sixteen Channel Servo Controller

The SER-16 Servo Card takes sixteen 0-10 volt control signals and translates them into the Pulse Width Modulated (PWM) signals that model airplane style servomotors want to see. New features include snap track mounting, indicator LEDs for each of the sixteen channels, and additional filtering on all the inputs.

Digital or Analog Animation Movements?

Animation movements come in two basic flavors: 1) Analog, and 2) Digital. Although we are used to thinking of everything 'digital' being superior to anything analog (like CDs vs. LP records), this is the one case where it just ain't so. Analog movements are used in almost all high-end animated figures. They give you a fluid, lifelike motion that digitals just can't do.

A Digital control is either off or on, just like a light switch. A typical digital animation movement is at either one end of its travel or the other, or moving between these two positions*. The speed of the action is set by the flow controls that control how fast the air (or oil) can get into and out of the cylinder.

An analog control is like the light dimmer on the wall of your dining room. It can be off, on, or at any point in between. The rate at which it is moving (within the maximum flow limitations of the valve) is controlled by how fast you are turning the knob. If you stop turning the knob half way through the rotation, the movement will stop there too. An analog movement will follow every nuance of how you turned that knob during programming and will be able to repeat it exactly. If something tries to push an analog away from where it was programmed to be, it will actually fight to get back to where it belongs.
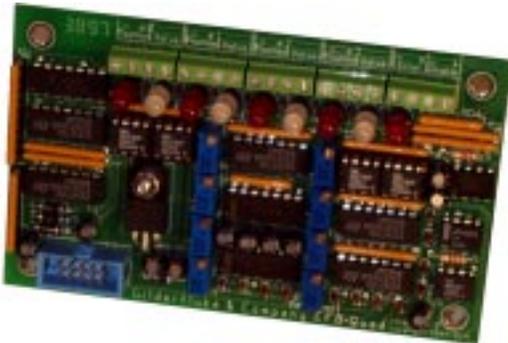
EFB-Quad Electronic FeedBack Card

How does it do this? Unlike open loop controls (digital movements are almost always open loops), the command signal to an analog movement does not control the valve directly. Instead, the command signal goes to some sort of Electronic Feed Back (EFB) card. Examples of these are our EFB-Quad, PID-Quad and BS-EFB. Here the command is compared with the actual position of the movement as measured by a device that is mounted on the movement (typically a potentiometer). If the movement is off by just a little, the EFB card will open the valve by just a little to get it back into the proper position. If the movement is off by a lot, then the EFB card will open the valve as needed until it starts getting close to where it should be. It then ramps the valve fully closed as the final position is reached to slow the movement smoothly to a stop.

Despite their added complexity, analog functions tend to be more reliable than digital moves. The reason for this is simple. Their closed servo loop allows them to adjust themselves (within limits) to compensate for cylinder wear, leakage and pressure variations. They are also smoother than digital functions. With less banging into the end stops of the cylinders, there is simply less wear and tear on the

mechanics of the figure. The two most common failures in an analog movement are a break in the wires leading to the feedback pot on the cylinder or a clogged valve. A unique feature of all of our Electronic FeedBack cards is the ability to sense wire breaks, and to turn 'off' the affected axis until help arrives.

So why aren't analog moves used for all animation? One reason. Price. The cost of the cylinder and its associated hardware is virtually identical for an analog or digital movement. The analog function does need a bit more electronic control, but this no longer represents a major cost. The servo valve does. The cost of a solenoid valve for a digital function might be between $20 and $30. The cost for a servo valve to do the same movement as an analog would be in the $500 to $1000 range. In addition there needs to be some sort of 'feedback' on the cylinder to tell the EFB card where the movement is at any given instant. When using a potentiometer, this can add from $25 (for a rotary pot) to $100 or more (for a linear pot or LVDT).

* There are variations in digital movements that use more than a single digital valve or cylinder. These allow some variation in speed and/or stopping mid stroke. With open loop controls, the repeatability can not be guaranteed as it can with an analog function. It is also possible to use a pair of four way valves or a single five way valve in a closed loop servo system. This will give you positional repeatability, but not the smoothness you get from a real ServoValve.

Electronic Feedback Fundamentals (& then some)

Now that you know the basics of analog and digital functions from the previous article, we will cover how an Electronic FeedBack (EFB) card works.

Electronic FeedBack cards typically use what is called a 'PID' loop to control the position of a movement. This type of loop is available on our new four channel PID-Quad and BS-EFB Electronic FeedBack cards. The 'P', 'I' and 'D' stand for Proportional, Integral and Derivative. Forget that. This is what they do:

The basic feedback loop is the 'P'. It is what is found on the simple EFB cards like our EFB-Quad. A simple loop like this has been traditionally used for controlling most analog functions in animated figures. This is because most figures' positional requirements are not stringent enough to demand a higher performance feedback loop.

The 'P' function compares the desired position with the actual position (as measured by a potentiometer or other measuring device that is attached to the movement). The difference is amplified and fed to a servo valve to open or close it as needed. If the 'gain' of the 'P' is turned up too high, then the movement will overshoot, and then try to get back, and overshoot again, and again, and again..... This is what is known as oscillation, and it is not a good thing.

The 'I' function is the one that is used to suck a movement in when it is too close to the desired position for the 'P' function to open the valve enough to overcome the

4

'stiction' of the cylinder. If the movement isn't perfectly positioned, the 'I' function generates a slowly rising voltage to the valve until it opens enough for the cylinder to move the last little bit to the desired position. If the 'I' function is turned up too high, then the movement will constantly seek the desired position, overshoot, and seek again. If the 'I' is adjusted too low, then the 'dead band' around the desired position will be wider.

The 'D' function is used so that you don't have to turn the 'P' up too high to get the movement to accurately follow fast changing commands. The 'D' gives an extra 'kick' to the valve when a movement is commanded to start quickly. If it is set too high, then the movement will start too quickly, overshoot the commanded position, and then slow down as the 'P' error takes over.

New PID-Quad Electronic FeedBack Card

Another adjustment that is available on our EFB-Quad or PID-Quad cards is a 'Velocity Limit'. This control allows you to set the maximum a valve can be opened by the FeedBack card. On the EFB-Quad it allows you to set the gain a bit higher to control oscillations by limiting the maximum opening of the valve. By raising the gain higher and limiting the velocity, you can narrow the 'dead band' of the servo loop.

The PID-Quad also has adjustment to add a 60 Hz dither signal or offset (null) to the output. The dither is used with some valves whose performance is increased remarkably when such a signal is applied. The nulling allows you to center the spool of the valve electronically if it wasn't centered properly in the factory.

The PID-Quad also features what are called 'Compliance' inputs. This adds a second 'force' feedback to an analog movement. This is usually a strain gauge mounted on the cylinder in addition to the normal position sensor. This measures the force being applied by the cylinder and feeds this to the FeedBack card. Sometimes an accelerometer on the movement or differential pressure transducer on the valve are used for a lower cost.

As a compliant movement is commanded to accelerate quickly, the inertia of the mass of the movement applies a force to the strain gauge. This gets amplified and added to the signal that the PID-Quad sends to the valve to open it further than just the positional error would have made it open. Conversely, when the movement is commanded to decelerate quickly, the strain gauge picks up the mass of the movement in the opposite direction and the feedback card can open the valve in the reverse direction to apply active braking to the movement as it approaches its target position.

The other thing that compliance does to a figure is to 'soften' it. If you press on a compliant movement (one that uses a strain gauge), it will sense this external pressure and the feedback card will actually open the valve to allow the movement to move out of your way. In complex figures, as one movement applies forces to other movements, they will respond to this force and all give a little. Of course, using pneumatics instead of hydraulics gives this effect even without compliance feedback. With pneumatic figures, the compliance feedback can be reversed to make the figure act a little stiffer, or a little more like a hydraulic figure.

Analog Smart Bricks Upgraded

All BS-ANA Analog Smart Bricks have now been updated to provide a true twelve bits of resolution on all of their outputs. This gives a possible 4096 positions between the two extremes instead of the 256 steps you get with an eight bit resolution. This upgrade has been made with no increase in the cost of the BS-ANA to you.

New Encoder Console......... continued from page 1:

Console can be used with virtually any incremental encoders. RS-422 differential inputs are standard. They can also be used with the lower cost 'open collector' or TTL level output encoders. Encoder input resolutions supported are 8, 12, 16, 24 or 32 bits per axis. Resolutions of eight or twelve bits are typically used in Animation applications. Resolutions of twelve or sixteen bits are used for most motion base applications. Resolution of sixteen bits and above are used to move a motion picture camera. PC·MACs supports resolutions up to 32 bits.

When used with the eight analog inputs, the Encoder Console supports analog resolutions of eight or twelve bits. This is suitable for most Animation and motion base applications. These inputs will accept analog voltages of 0-5, 0-10, +/- 5, or +/- 10 volts.
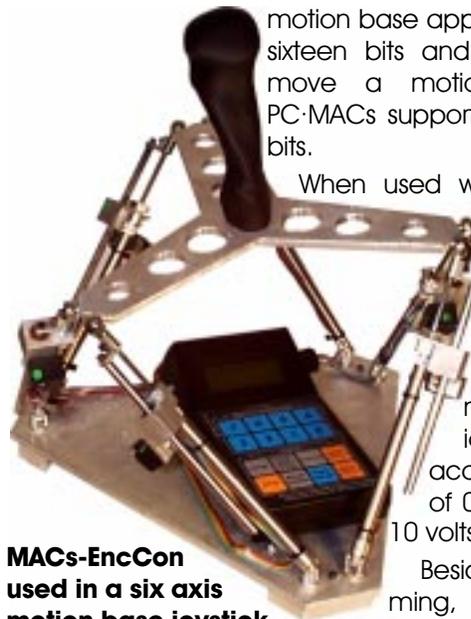
MACs-EncCon used in a six axis motion base joystick

Besides analog programming, up to eight digital inputs can be programmed at one time. In a unique arrangement, the digital inputs can come from the buttons on the front of the Encoder Console, or from external switches. This allows either the digital inputs or the analog 'assign' buttons to be remotely located.

A four line by sixteen character LCD display shows the names of the movements being programmed. You can select whether the names of the movements, names and current values, or current values only are displayed on the screen. In the latter mode, the values of all eight analog inputs can be displayed simultaneously.

App. Note for Motion Bases

We are now supplying control systems for programming and automated animation playback for many Motion Base manufacturers. One of our basic Smart Brick Systems can control any number of axis while controlling and synchronizing to up to seven LaserDisk players (or synchronizing to Smpte time code) with up to 255 different shows.

To help those who already have or may be considering our equipment for Motion Base applications, we have a schematic and notes on a 'typical' Motion Base installation. Specialized features that Motion Base builders may be interested in are E-stop loops, operator panels and indicators, door, lighting, and special effect controls.

Features just about any Smart Brick System users may be interested in are multiple show selections and branching to other shows (or not) based on external switch inputs.

Some Atchley Parts Available

Although we no longer distribute Atchley Servo Valves and actuators, we still have a small stock of parts available. Most of these are the Mechanical FeedBack Actuators which combine an air cylinder, valve and feedback in one compact package. Although the prices of these parts all doubled, we still have them available at the original prices. Once these are gone, they are gone. You might want to pick up a couple of these cylinders as spare parts.

Reliable Servo Motors

Model airplane-style servomotors are popular for short lived, lightweight animation. Typical of these are movies and similar applications. Their problem is that in any permanent installation they just don't last very long.

Servo Motors are now being built by CK Design Technology (voice: 805/522-3750 FAX: 805/522-3750) which are designed to last for tens of millions of cycles (your actual lifespan may vary with load and speed). Some of them even have the horsepower to move heavy loads.

Typical of these new actuators are their new two inch stroke 'Mini' linear actuators. They are about 4-1/2" long, less than 1" thick, and 1-1/2" tall, and come in two load ratings: The first has a six pound operating load rating (20 pound stall) and moves at a speed of six inches per second. The second has a twelve pound operating load rating (35 pound stall) and moves at a speed of three inches per second.

Easy Eprom Saves in PC·MACs

Most Animated shows are programmed using our PC·MACs Programming System. Once programmed, the shows are then downloaded to files which can be burnt into Eproms and plugged into the 'Bricks' which make up most permanently installed Animation Control Systems.

The commands from PC·MACs for burning Eproms used to make you open up each show and save them to an Eprom file one at a time. Once done, you would then burn your Eproms.
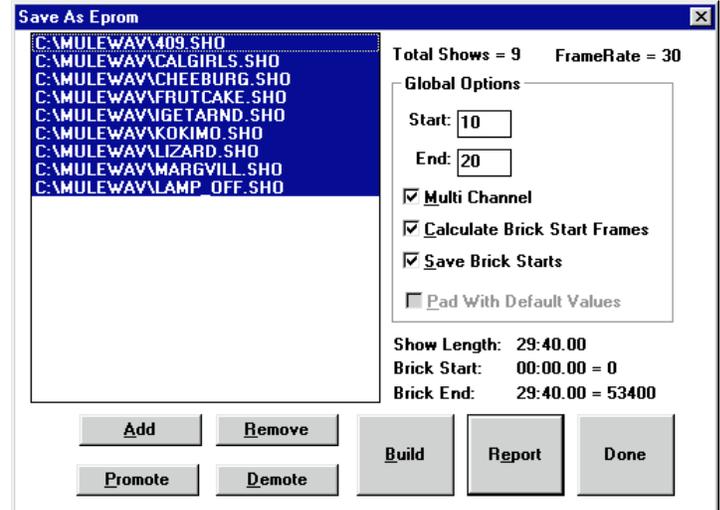
New dialog box for 'Save as Eprom.....' command

PC·MACs has now had a complete rewrite of the 'Save as Eprom...' command. It now allows you to open up any number of shows at one time and save all of them in a single operation.

As an option, the 'Save as Eprom...' command can calculate the appropriate 'Brick Start' to offset each show into the Eprom files. This saves you the trouble of doing this yourself. When the 'Save as Eprom...' command has finished, it will generate a report with all of the frame

Report generated by new 'Save as Eprom.....'

numbers and offsets displayed for easy configuration of the Smart Brick Brain that will run the permanently installed shows. This can be displayed on the screen, printed or saved for later reference.

In the examples above, we have saved nine shows to a multi channel Eprom file for channels 10 through 20 (11 channels total). We have asked PC·MACs to calculate all of the brick starts for us, and save them for next time we save Eproms. The 'Brick Start' and 'Brick Ends' are what you enter into the Smart Brick Brain for each of the shows.

Field Installation & Service

Our Animation Control and Digital Audio Systems are designed to be as easy as possible to install. With hundreds of our systems installed each year, we are asked to actually go on site only a few times each year. Most installations are done by the animation companies or end users.

Gilderfluke technicians are available for installations worldwide. For installations outside our immediate area, you will need to pay all of the usual transportation expenses (business class or better airfare, hotel, food, and a reasonable per diem) in addition to the fee for the technician.

Another possibility may be an experienced freelance technician. There are qualified professionals who can do installations and service in several corners of the country.

Ambient Environmental Soundscapes

We are often called upon to provide audio playback systems for environmental soundscapes in museums, restaurants, theme parks and shopping malls. These are typically the background sound for a jungle, forest, or other simulated 'outdoor' environment. Other places where they can be used are in simulated industrial or other manmade environments. Just think of what the bridge of the starship Enterprise would feel like without all of the rumbling, beeping and other sounds coming from all of the equipment.

Almost always we are asked to provide a complicated multitrack sound system with a programmed controller and hours and hours of material so that the sounds never repeat in a predictable pattern.

Although we can provide this type of system, we usually recommend a much simpler installation using our DR-50 MiniRepeaters. These reproduce sound at about the same quality as a new cassette tape. Thirty-two of them fit into a single 1U rack card cage. With several of them looping continuously with slightly different length loops, they can be made to provide a virtually random sequence of sounds.

Some of the sounds, like frogs, crickets, waves, rain and waterfalls should be looped on their own repeaters without any pauses. These play continuously from their own dedicated speakers. Not even the most bored tourist would have the patience to listen to sounds like these to determine that they are looping at thirty second, forty-five second or even one minute intervals.

Foreground sounds, like bird calls, wind, thunder, monkeys or other animal noises (even the occasional frog or cricket solos) are recorded on their own Eproms along with long silence(s) (or lower level sounds) recorded at a 2 KHz bandwidth. Each sound is recorded so that it loops at a slightly different length. By doing this, the sounds will be layered in what becomes a pseudo random pattern. The audio outputs from these MiniRepeaters can be played through their own point source speakers or mixed with other sounds.

Our MiniRepeaters hold only a single sound Eprom. You can mix multiple messages of different bandwidths within this single Eprom. At a 15 KHz bandwidth, this one Eprom can hold up to 30 seconds of sound. Most animal noises are at 5 KHz or lower. At this bandwidth the capacity of each Eprom is 90 seconds. Even though there are almost no sounds that extend to this level, at a 2 KHz bandwidth, you can put 223 seconds in each Eprom. If longer sounds or a higher bandwidth are needed on some of the audio tracks, some of our full sized repeaters can be used as well.

An Eprom with one or more 7.5 KHz sounds totaling 15 seconds in length on it also has room enough for almost two minutes of silence.

Application Notes

We are often asked to help our clients with specific projects and questions. If we get asked for the same question more than a few times, our 'stock response' will usually evolve into an 'application note'. The subject of these range from "How to hook up pneumatic cylinders" to "How to build a simple programming console" to "How to attach an animation system to a remote control".

Who knows, even if your application seems pretty bizarre, we may well have the answer in one of our application notes. Just give us a call to find out.

Gilderfluke & Co. Show Plans

We are scheduled to exhibit at the following trade shows and conventions in 1997 and 1998. Most of the equipment described in this newsletter will be on display at these shows:

Sept. 24-26, 1997: Fun Expo at the Sands Expo Center, Las Vegas, Nevada

Oct. 14-16, 1997: World Gaming Congress & Expo at the Sands Expo Center, Las Vegas, Nevada

Oct. 24-26, 1997: Lighting Dimensions International (LDI) at the Sands Expo Center, Las Vegas, Nevada

Nov. 19-22, 1997: IAAPA (International Association of Amusement Parks and Attractions) at the Orange County Convention Center in Orlando, Florida.

Mar. 13-17, 1998: Halloween Expo at the Rosemont Convention Center, Rosemont, Illinois

June 12-14, 1998: Show Biz Expo at the Los Angeles Convention Center, Los Angeles, California

Our Two Most Asked Questions

In the fifteen or so years we have been in business, the second most commonly asked question is where our company name came from.

Eli Gilderfluke was a cartoon character who appeared in railroading trade magazines in the middle of the 19th century. More or less a precursor of Rube Goldberg, he developed strange inventions for steam trains. These were things like a big scoop to catch the exhaust coming out of the smoke stack and feed it back into the engine's firebox.

The answer to the most commonly asked question is: '*No, we don't build animated figures*'.

Who Are We?

Gilderfluke & Company was founded in 1983 to build Animation Control Systems for theme parks, museums, and other entertainment venues. In 1988 we added audio systems to our product line, and became the first company to be able to provide the entire electronics package for your animated show or attraction.

We currently deliver an average of two to four Animation Control Systems each week. We are the only company that delivers complete, off-the-shelf Animation Control Systems from stock. Most of our systems are bought by large Animation Manufacturers for incorporation into their shows.

Our PC·MACs Animation Systems are the first to run under Microsoft's Windows. It is the technological leader among Animation Programming Systems. Our 'Brick' Animation Control Systems are the largest selling Animation Control

Systems in the world. These are modular systems which can be used to control any sized shows you can imagine.

Our Digital Audio Systems are led by our DR-3000 and AB-3000 series of Repeaters. These store CD-quality audio on computer-style memory for any installation where you need a sound to play reliably and with zero maintenance; forever. From two to thousands of outputs are available.

Our DR-50 and AB-50 MiniRepeaters are used when you need to store one or more relatively short sounds. Their audio quality is about the same as a new cassette tape. The stand-alone AB-100 can be used for longer spiels.

Our Intelligent Public Address Systems can be used in any application where you need 8 to 256 audio output zones. Any PA announcement can be sent to any output or combination of outputs. Each output has its own corresponding Background Audio input. Up to 256 PA stations can be attached to each PA System.

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Gilderfluke & Co.
ROBOTICS & SOUND SYSTEMS
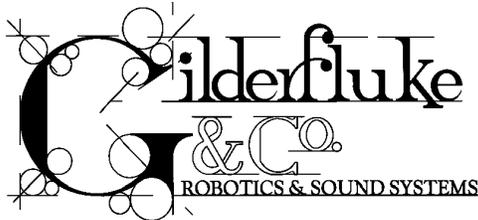
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