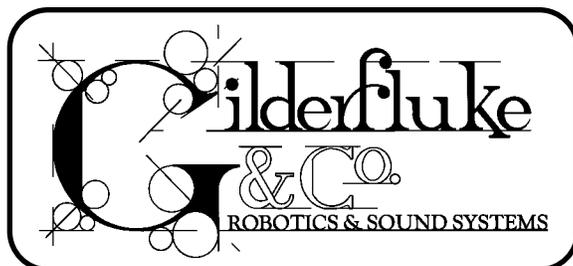


**LA Weather:
Sunny and Warm
Continuing for
the
next year or so**



**All the News
that we could
jam into a little
under 4 pages**

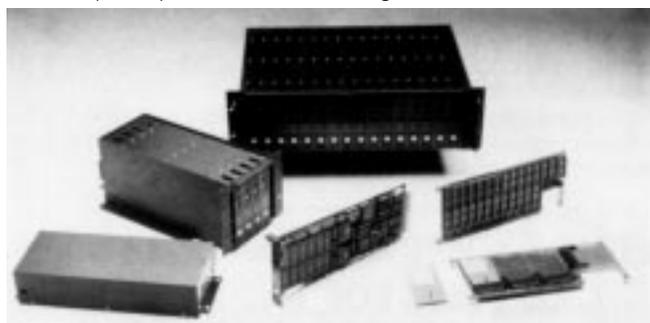
Views and News from the world of Gilderfluke & Co.

November 1993

Volume 1 Number 3

DR-3000 SERIES OF CD-QUALITY DIGITAL AUDIO REPEATERS AVAILABLE

We are officially introducing our newest line of Digital Audio Repeaters at the International Association of Amusement Parks and Attractions (IAAPA) convention in Los Angeles this November 17-20.



Now for the shocker. Not only do these new Digital Audio Repeaters have many more features than our older eight bit repeaters, the installed cost is even lower! Plus they sound as good as a CD player!

How is this possible? We are using audio chips that are being used in CD players, DAT machines and similar equipment. These chips are more powerful than those available just a short time ago, but are far less expensive. Since they are made to reproduce two audio channels, our DR-3000 series of repeaters each have two audio outputs. Only half as many repeater cards are needed in most applications!

You will be pleasantly surprised to find that we were able to add even more features than we had announced in our last issue:

- Each DR-3000 card is a complete audio playback system except for amplification and speakers. Any number of DR-3000 cards can be used in a system to provide any number of simultaneous audio tracks.
- An AB-3000 is a complete audio repeater with case and power supply. It can be mounted anywhere you require just one or two CD-Quality audio tracks. All you need to add are amplifiers and speakers.
- Sample rates supported are at 11KHz, 22KHz and 44.1KHz for audio bandwidths from 10Hz up to 20KHz.
- 256 x oversampled sixteen bit linear encoding for dynamic audio range of 96 dB. This gives these repeaters a sound quality which is identical to a Compact Disc (CD) player.
- Audio is sampled using virtually any sixteen bit audio card running on any Macintosh or PC. Any card that generates a AIFF (Apple and Amiga) or WAV (PCs and compatibles) file can be used. We provide a simple program which compresses and converts these industry-standard files into the format needed to program the memory chips used by our repeaters. If your sampling system has a digital input, or if the sound is originally generated digitally, there is no need to transfer the audio as an analog signal.

~ continued on page 2 ~

PC-MACs GETTING WORLDWIDE RAVE REVIEWS

We have been shipping our new Microsoft Windows-based Animation Control System, PC-MACs, for about six months now. So far, it has been used in motion picture and television production, programming simulator rides, animated shows, and all kinds of other attractions. Three of the largest theme parks in the world have used PC-MACs on shows (one owns a system, and another soon will), and three of the largest animated show manufacturers already own systems or have used them for their in-house show programming needs. Literally millions of people have already enjoyed shows which have been programmed by a PC-MACs System!



Examples of the successes users have had using PC-MACs are coming in all the time. One user reported that their technicians had learned to use the system in 'about 15 minutes'. On one of the first film shoots to use the system, the artists who were operating PC-MACs had literally no experience with any computer before. Within a day or two they were using its most complex editing functions to program fully articulated mouth and facial movements. Of course, PC-MACs made this a lot easier by automatically cleaning up all their edits as they made them!

SIXTEEN BIT MINIREPEATERS ARE COMING SOON

With our new DR-3000 series of sixteen bit Digital Audio Repeaters starting to roll off the production line, we are already working on a complimentary line of sixteen bit MiniRepeaters!

These new DR-500 and AB-500 MiniRepeaters will take the place of our eight bit DR-50 and AB-50s, just as the DR-3000 line is taking the place of the DR-300 line. Additionally, a small memory expansion board may be available for the new Mini Audio Brick so that it will be able to take the place of our AB-100 Audio Brick.

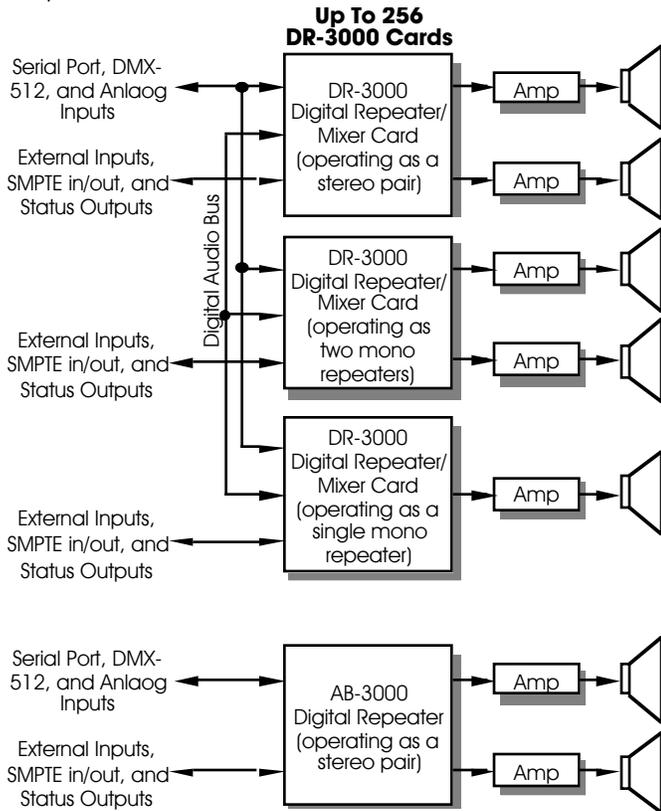
Like our new DR-3000 line of repeaters, our new MiniRepeaters will each have two audio outputs on them. These can be used as a stereo pair, or as two independent mono outputs.

The design goal of all our MiniRepeaters is to build the best sounding repeaters possible, at a cost that is comparable to lower audio quality repeaters available from other manufacturers.

~ continued on page 4 ~

DR-3000 Digital Audio Repeaters... continued from page 1

- Each repeater can be used as two independent mono repeaters or as a stereo pair. Half as many cards are needed in most applications.
- Any number of DR-3000 repeaters can be synchronized within 1/44,100 of a second for use as a multitrack bin loop tape deck replacement. Multiple bin loops as well as independent repeaters can be operated within the same card cage.
- Digital Mix Bus allows audio to be sent digitally between cards and mixed into their outputs with zero loss. Any DR-3000 can mix up to four digital audio tracks from other cards into its output.



- For the cleanest possible sound, all VCA, EQ, and all other audio functions are handled digitally. The entire audio path is from the Digital to Analog Converter (DAC) through one operational amplifier and to the output driver chip.
- Audio data is stored in EPROM, RAM, or FLASH memories. With a suitable expansion card, PCMCIA memory cards can also be used. A special card is available which allows a PCMCIA hard disk drive to be used (when using this hard disk drive, the card must be used as a stereo pair, or only play one mono audio track at a time).
- Most types of memory are programmed using any commercially available chip programmer, and then plugged into the repeaters. RAM, FLASH and suitable PCMCIA memory cards can be programmed in place if desired.
- Lossless data compression (up to 4:1) is available. The repeater can actually stop using memory completely if an instant of silence occurs!
- Low cost memory expansion cards can be used if more storage time is needed. Each repeater can support up to 15 memory expansion cards. Up to two expansions can be added to an AB-3000 (or the lid can be left off for unlimited expansion). The circuitry and software on the repeaters can address up to approximately 24 hours worth of memory!
- Up to 255 different messages can be stored on each repeater. They can be instantly accessed via the optoisolated inputs, serial port or DMX-512 input.
- Eight optically isolated inputs can be used to start and randomly select messages, start and stop playing, fade in or out

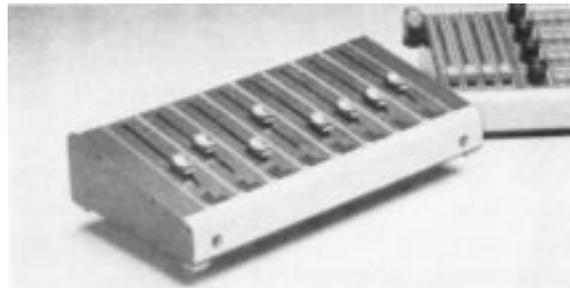
and adjust volumes.

- Eight 0-10 VDC analog inputs can be used to remotely adjust output and mix levels on each card.
- High speed USITT DMX-512 standard serial input allows any number of repeaters to be controlled through just two wires from a PC-MACs Animation Control System (or most lighting controllers).
- SMPTE time code input allows messages to be triggered directly from a standard time code input.
- Optional Real Time Clock allows sounds to be scheduled to play at specific times, chime on quarter hours, and even toll on the full hours. To keep the neighbors happy, it can be told to be quiet in the middle of the night.
- RS-422 serial port can be used to control all of the functions of the repeaters and for configuration via any computer or terminal.
- Front panel for making volume, equalizer and other adjustments. All adjustments are stored digitally and can be backed up or easily moved to another repeater. Some or all of the front panel's functions can be disabled if desired.
- Two balanced line level outputs per card. Optional fiber optic or wired SPDIF or AES/EBU digital outputs are available.
- SMPTE time code output is generated as a card is playing to synchronize other equipment to the repeaters.
- Supports our Intelligent PA Systems. No external audio wiring is needed to add PA system support.

As with our earlier repeaters, you can send us a tape to load onto these repeaters (preferably a 44.1 KHz DAT) or you can burn the sound into them yourself.

FLYING FADERS AND ENCODER SUB-CONSOLES FOR PC·MACS

Have you ever seen flying faders at work? These are the motorized slide pots that can move all by themselves. They are typically used in high-end recording studios on their very expensive automated mixing consoles.



We will be introducing a new flying fader sub-console at IAAPA '93 in Los Angeles this November. It plugs into the expansion port on the side of a PC/MACs Programming Console.

This console has eight slide pots which can be used for programming eight or twelve bit resolution analog movements. If you release any of the faders' knobs, they will instantly go into a 'play-back' mode. The movement of the pot will follow whatever has been previously programmed on that channel. Even if you barely touch the fader's knob, that channel will immediately go back into 'record' mode. Any movements you make on the slider will be remembered exactly.

Also under development is another sub-console which adds several high speed (20 MHz), high resolution encoder inputs.

SOFTWARE UPDATES...

Such is the nature of software.....it is never done. If you need to get an update of any Gilderfluke & Company software product, please contact us. Except for ROM updates, most software updates are free.

HIGH RESOLUTION SERVO AND STEPPER MOTOR CONTROLS

PC-MACs Animation Control Systems support analog resolutions of up to thirty-two bits. This gives a maximum number of steps between the two extremes of an analog movement of 4,294,967,296 steps. Of course, not too many applications need this sort of positional accuracy. Those that do are generally used for positioning cameras, where every little joggle can show up as a big jump on the screen. To give you an idea of what this kind of resolution means, if you were to make a camera track 100 miles long, PC-MACs would be able to position the camera within .001 of an inch!

Rather than build high resolution servo and stepper motor controls ourselves, we are currently developing simple interfaces between PC-MACs and other manufacturer's motor controllers. Please let us know what features you would like to see on these cards, and if you prefer any particular brands of motor controllers.

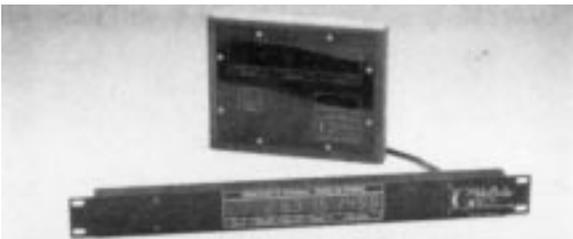
VIDEO, THE FINAL REPEATER FRONTIER..

We have been building audio repeaters for over six years now. What about video? A single track of uncompressed CD-quality digital audio takes about 5 MBytes per minute to store. By comparison, the same amount of broadcast quality video takes about 130 MBytes to store!

The good news is that standards for compressing video are being developed which will eventually make it practical to store video in memory chips. The chips for decompressing MPEG-1 are already available. Unfortunately the MPEG-1 standard doesn't give a high enough quality image for us. Chips for the newer MPEG-2 standard will be available soon. These will make a one minute solid state video repeater practical within the next one to two years. The cost, with memory, should be only slightly higher than that for a LaserDisk installation.

HEADS UP DISPLAYS COME IN TWO FLAVORS

We offer Heads Up Displays in two different models. Either one works with either our Smart Brick or new PC-MACs Animation Control Systems. We are often asked the difference between the two.



The standard **Heads Up Display** is simply larger. The time digits are 1.1 inch tall, and the display isn't multiplexed so that it can be filmed or videotaped without strobing.

All of the characters on the 19 inch **Rack Mounted Heads Up Display** are .6 inches high. The display is multiplexed, and so may show some strobing when filmed or videotaped.

HIGH GAIN BRAINS

The SMPTE time code readers used on all of the products manufactured by Gilderfluke & Company have been designed for a 0 dB input level. This has always worked fine with professional level and good quality amateur audio systems. Where it has fallen short is when used with low quality tape equipment. All Smart Brick Brains and PC-MACs SMPTE cards have now had their gains increased. They will now work with signals that are too low to be read on the

eters.

APPLICATIONS FOR THE INFRARED LINK

In our last issue we introduced our new IR Link for use with our Digital Audio Repeaters. Unfortunately this has caused some confusion among our readers. If you just need to trigger a repeater or animation system when someone or something breaks a beam, there are all sorts of sensors commercially available from other sources for doing this. The IR Link is designed to trigger a specific message from an audio system carried on board a vehicle as it passes a particular point along its path.



The infrared (IR) transmitters are placed along the vehicles' path, and continuously broadcast requests for specific messages to be played. As an IR receiver and Digital Audio Repeater-equipped vehicle pass each transmitter, it picks up the signal and plays the appropriate sound or message. Typical applications are on trains, dark rides, trams, monorails, rollercoasters, subways, and a variety of mass transit systems. Each repeater can hold up to 255 messages of virtually any length.

SELF-PROTECTING OUTPUTS

How would you like to eliminate the fuses on the output of our Animation Control Systems? We have been phasing out fuses on several of our existing products, and on all of our new ones. What are we using to take their place? A new electronic device called a 'PTC Fuse'.

A PTC fuse is used to protect the supply lines to each 1/4 J6 cable. They act just like solid state circuit breakers. Under overload conditions that would destroy a fuse (that what is supposed to happen to fuses), these devices just heat up and 'turn off'. As soon as the overload condition is removed, they cool off and turn back 'on'.

The eight channel output driver chips we have used on our animation system cost considerably less than eight fuses, so they have been used as the 'fuses' on the individual outputs. On revision 1.01 and newer Digital Output Cards on PC-MACs systems we have started using new driver chips. These are an improvement over the older chips in that each individual output is protected from overload and overheating. When faced with an overload condition, they just turn off like a circuit breaker until they are reset by temporarily removing power.

For those of you with older Digital Output Cards, they can be retrofitted by simply plugging in these new chips.

JUST WHAT IS THIS COMPLIANCE?

'Compliance' is a term that has been bandied about lately as a prime technology in the next generation of animated figures. But what is it? Basically a new term for an older industrial control technique.

Analog animation movements have traditionally used a single 'positional' feedback loop. A sensor on the movement continuously compares the current position with the desired position, and opens a servovalve as needed to bring the movement back to where it should be.

Compliance adds a secondary feedback loop to the positional feedback loop. Along with the position error, the 'force' being applied to a movement at any moment is also factored in. This normally requires the addition of a 'strain gauge' or 'accelerometer' to each movement to sense this force.

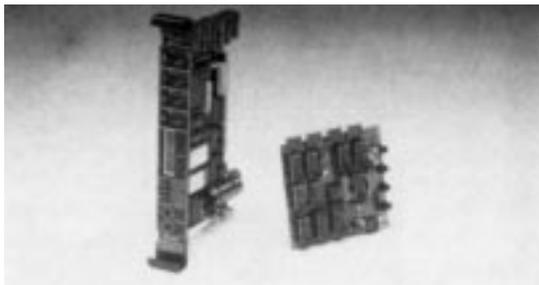
As a movement is commanded to accelerate swiftly, the force

required to overcome the inertia of the movement will send a signal which causes the servovalve to open a little more than would be
c o n t i n u e d
caused by just the positional error. This makes the movement accelerate faster than it might otherwise.

Conversely, as the movement decelerates quickly, the inertial force as it slows will cause the valve to close further than it would otherwise. If this inertia is great enough, the valve can even open in the reverse direction and apply active braking to the movement.

If the secondary feedback loop uses a strain gauge, the movements can interact to create a 'softer' look in a figure. If you push on a movement, it will actually get out of the way! Of course, good programming techniques (or using pneumatic rather than hydraulic cylinders) can give you this effect too.

Where does all of this leave you? As luck would have it, we will be introducing at IAAPA '93 an intelligent version of our Electronic Feedback (EFB) Cards that include secondary feedback loop inputs.



Being intelligent, this card eliminates all pots and manual adjustments. Everything is set up using a computer or dumb terminal like our Digital Audio Repeaters and Smart Brick Brains. Once programmed, the movements can be burned into this card so that it can control four analog movements all by itself. An optional LVDT (Linear Variable Displacement Transducer) signal conditioner is also available for those who need it. This card should be available in production quantities by the end of the year.

Sixteen Bit MiniRepeaters... continued from page 1

The way we do this is to make a smaller version of our full sized repeaters without some of the advanced features that aren't needed in most applications. These are features like the PA System support, analog inputs for VCAs, and the like.

Our current MiniRepeaters hold about 15 seconds at 15 KHz bandwidth. Our new MiniRepeaters should have approximately the same length capacity, but at a CD-Quality 20 KHz bandwidth, 96 dB dynamic range.

AUTOMATED PLAYBACK FOR PC-MACS ANIMATION CONTROL SYSTEMS

Another new product we will be introducing at IAAPA '93 will be a program for automated playback and scheduling of shows on PC-MACS Systems. This program will allow you to have PC-MACS start playing in the morning and turn itself off at night, schedule the time delay between shows, the order in which they play, and schedule specific shows to play at any time of the day or night.

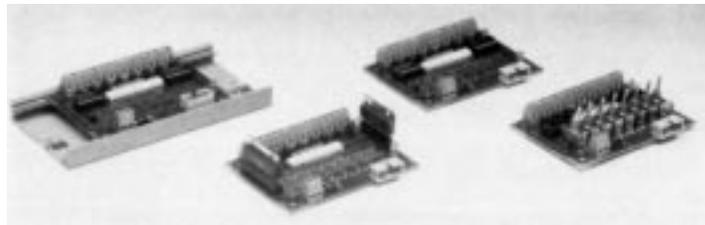
APPLICATION NOTES

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.

NEW HIGH CURRENT BUFFERS

We have three new eight channel DC current boosters available for driving higher current relays and solenoid valves from our Animation Control Systems. Each is a 4" wide x 2-3/4" printed circuit card. It can be mounted in Augat 'snap track' or on simple stand-offs.



The continuous current capacity of these cards is 700 ma., 1.5 amps, and 3.5 amps, respectively. The lowest current model has the advantage of being electronically protected against current overload and overheating.

Each card has an optoisolated 1/4 J6 input and eight pairs of screw terminals for attaching your loads. The 8 to 24 VDC power for your loads is bussed from a two position screw terminal. LED indicators show that the J6 input's fuse and load power supply are OK, as well as the status of each output. All outputs include flyback diodes for use with inductive loads. As an option, you can order these cards with Hand/Off/Auto switches on all the outputs.

GILDERFLUKE SHOW PLANS

We are scheduled to exhibit at the following trade shows and conventions in 1993 and 1994. Most of the equipment described in this newsletter will be on display at these shows:

- Nov. 17-20: IAAPA (International Association of Amusement Parks and Attractions) at the Los Angeles, California Convention Center
- April 7-9: NSCA (National Sound Contractors' Association) at the Las Vegas, Nevada Convention Center
- June 11-13: Show Biz Expo at the Los Angeles, California Convention Center

BECAUSE EVERYBODY STILL ASKS...

In the dozen or so years we have been in business, only one person thus far has had even the slightest notion of the origin of our company's name. This was a (now retired) ride mechanic at Disneyland.

Eli Gilderfluke was a cartoon character who appeared in rail-roading 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.

How was that for an obscure reference?

