RADIO GUIDE

A Forum for Radio Engineers

Ray Topp Editor/Publisher (507) 280-9668

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IT'S BEEN A GREAT YEAR, BUT JUST WAIT . . .

Despite all the bumps, warts and mistakes, we're still here. It's great to have the support of both the manufacturing and engineering communities. Radio Guide was born of the same philosophy that guides most successful radio stations. Choose a target audience, give them the programming they want and need, and then sell to the clients that wish to reach them. It's a simple but effective idea - - so we gave it a shot.

Choosing the "target audience" was easy. I've been in radio engineering for around 20 years, so creating a nut & bolts publication for radio engineers seemed the natural thing to do. The need was there, but the technical articles weren't.

The "programming" is a bit different in Radio Guide. The direction and content of this publication is up to you. What you send in, is what gets printed. So, as I've said before, the success of Radio Guide is in your hands.

In the past few years, the word has gotten around that engineers do not specify equipment general managers do. Most of us can agree that the GMs do hold the purse strings, and usually decide when to buy. But how many GMs do you know have the knowledge to decide what to buy? Times have changed. There are a lot more contract engineers than before and many station engineers serve dual (or triple?) duty. But let's face it, while GMs, PDs, etc., are more knowledgeable than before in the technical areas, who has to install, maintain and repair the gear, and should have the greatest input during equipment selection? The engineers - - whoever or wherever they are. This is why advertisers are finding out that Radio Guide works for them. It is this final, and often maligned, "sales" factor that helps the Radio Guide work for us as well.

Our advertising space will be kept uncluttered and straight forward. Our technical copy will remain practical, useful, and unbroken by a plethora of mini-ads. Most importantly, I WILL listen to your suggestions and I WILL incorporate them into the Radio Guide. This really is your forum, and the proof is not in what I say but in what you see - - just watch. With your help, Radio Guide can become the publication you've always wanted!

Ray Topp . . .Editor

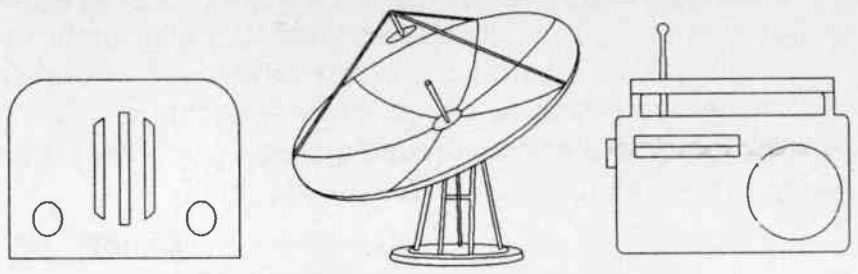
Availability of FCC Rules in Loose-Leaf Form

The Commission now has available, through the Government Printing Office's Superintendent of Documents, the loose-leaf form of its rules. Below is a list of Volumes and Parts, together with stock numbers and prices as quoted by the GPO.

Publication	Stock Number	Price
Volume I (parts 0,1,19)	00460-4	9.00
Volume II (parts 2,5,15,18)	00459-1	11.00
Volume III (parts 73 & 74)	00471-0	17.00
Volume IV (parts 90 & 94)	00474-4	11.00
Volume V (parts 21,22,23,25)	00462-1	10.00
Volume VI-B (parts 41,42,43)	00463-9	2.25
Volume VII (parts 61-69)	00462-1	10.00
Volume VIII (parts 76 & 78)	00473-6	4.00
Part 13	00458-2	1.00
Part 17	00461-2	1.50
Part 80	00475-2	6.00
Part 87	00466-3	3.25
Part 95	00467-1	2.00
Part 97	00468-0	3.00
Part 99	00469-8	1.25
Part 100	00470-1	1.00

Further information may be obtained directly from the GPO Bookstore at (202) 783-3238.

Editor's note: These are the long absent, 8 1/2 x 11, full size rules & regs. They are 3-hole punched and fit into regular size loose leaf binders. You won't need a magnifying glass to see the text and diagrams on these. The GPO actually takes VISA or Mastercard too! Who says the Fed is not up to date? Don't waste your money on so-called "rules services". This is the real thing - - and cheap too!



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We Get Letters . . .

Dear Ray:

Back in the October issue of Radio Guide, I made a plea for help concerning my Harris 2.5K transmitter that kept burning up its loading capacitor. Since then, I've received a whole lot of phone calls from concerned engineers with lots of good ideas and advice. Thank you.

By the way, I received 10 calls in two weeks from Indianapolis; Huntsville; DeKalb, IL; West Plaines, MO; Muskatine IA; Stockton, CA; Bradenton, FL; Chicago; Cedar Rapids; and here in Flint. I'd say your Radio Guide is really a success.

The most common advice was to put in a vacuum variable; I think most of us can understand the logic of that. But, considering that this transmitter had operated for seven years previously without this problem, I really wanted to fix the problem and not the symptom.

Anyway, after the problem eluded me and some other very good engineers, I decided to do something with the capacitor. About this time Terry Hollenberg called me with what seemed like a great idea. He would take an air-variable capacitor and try to insulate it with this chemical with Teflon in it. I'd put 6 caps in, within the last 20 months - - what's one more? So, Terry and the people at Harris used a chemical called Permalon 327 by Russel Products and sent me a new cap with the rotor and stator fins coated with it. I've got it installed now and everything is working properly (knock on wood). Of course it may take a few months before an RF burn or stress becomes evident, but I've got a good feeling about this.

Thanks to Radio Guide, all the engineers who called, and Terry and his staff.

Dan Greer - WDZZ-FM - Flint, Michigan

For Your Information . . .

A new and continuing feature of the Radio Guide, is the reader-service "coupon" located on page 12. Fill in all the information asked for, and circle any advertiser's number from which you wish to obtain more information. Along with the "coupon", feel free to send a couple of technical tips you may have lying around. We can use them!

Editor . . .

It's Time For An SBE Town Meeting

Since it's tough to get the majority of SBE members across America in one place at one time (particularly in winter!), we're planning a national get-together on the ham radio bands. There's a way non-hams can participate too - - we'll have a telephone "request line" set up so that you can phone in your comments as the meeting proceeds. All you need to listen, is a short-wave receiver.

Here are the particulars:

SBE Chapter 73 (Chapter of the Air)

Sunday nights, January 15 & February 12, 1989

14.205 mHz (+/- interference)

6 p.m. CST (7 p.m. EST, 4 p.m. PST)

We'll have officers and board members of the SBE on hand to moderate the discussion, and we're contacting you to help us to get other opinion leaders from our industry on frequency to add their two cents worth.

I've noticed that the typical ham/broadcast engineer doesn't have the big-gun station on the band; me included. Maybe we're all too busy keeping our "real" broadcast stations going to put the time and energy into the big signal on 20 meters. In that case, maybe you can operate the station of a big gun in your market, for this occasion. If I can successfully feed 1500 Watts into a 400 foot tower, that's what I'll be using.

The topics for discussion? Well, for starters, the Executive Board will be fresh out of a meeting on January 12th, where they'll be discussing the current "hot topic" of Professional Engineer state licensing of broadcast engineers and the 1989 National SBE Convention in Kansas City. You undoubtedly have some questions or comments of your own, so why not join in.

May we also suggest that you get a group together at a local member's ham rig, or tape the meeting to play for other chapter members who can't be with us? Please help us accomplish one important task of our Society - - communication!

Steve Brown,

WLTE-FM - Minneapolis, Minnesota

SBE National Chapter Liaison Committee Chairman

Robot Remote

By Robert Miller - KGWA
Enid, Oklahoma

Need to save the set-up, "baby-sit" and tear-down times for your scheduled repeat remotes? We had four churches that rotated each Sunday's service on a continuing schedule. Economics dictated a change. We proposed that each church order a dial-up telephone line installed and we would build and install the interface to transfer the audio from their public address system to the telephone line. Advantage? Church personnel could call their telephone number at any time, other than broadcast Sunday, and check on the progress of worship service, weddings, funerals, etc. We could save the time and equipment wear and tear of repeated set-ups and tear-downs. They agreed.

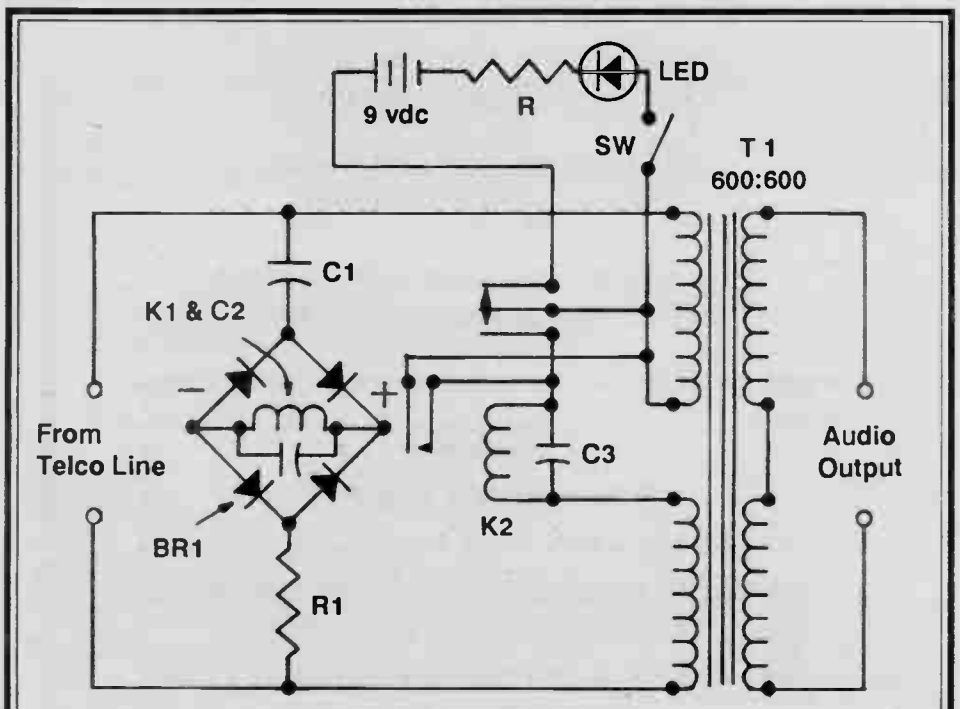
We already had a telephone coupler system wired into the board, so ... we just build an interface that would hook up automatically, when called. Here it is!

A 3 X 5 inch PC board was etched to mount all of the components except the transformer. If a Stancor A4350 cannot be found, any 600:600 split winding transformer will do. The components will mount nicely into a Radio Shack utility box. Have the telephone company install their modular jack near the PA system so that the "Robot" can easily be connected between the PA output and the telephone line.

How does it work? The ringing voltage (around 90-100 VAC) appears across C1, BR1 and R1. BR1 rectifies the voltage to DC, which appears across K1 and C2. K1 operates and is held by C2. K1 connects the upper coil of T1 to K2 and C3. The DC telephone line voltage causes K2 to operate. K2 contacts then maintain the DC flowing through K2. The ringing voltage stops because K2 "answered" the call. C2 discharges through K1, and K1 releases. C3 performs the function of audio bypass to insure that K2 remains closed by the telephone DC voltage. C3 also provides a low impedance audio path across the secondary coil split of the transformer.

Yep, you got it! You can stick on of these things in your sports package and when the telephone line "glitches", the control studio operator waits 25 seconds and calls the sports crew back.

If you want an indicator for your remote crew, hook a 9 volt battery, a current limiting resistor and an LED in series from the normally closed contact of K2 to the armature contact of K2. When K2 operates, the LED goes out and the remote crew knows that they should be ready.



C1 - 3.3 uF/50V (non-polarized)
C2 - 1500 uF/25V
C3 - .47 uF/100V
R1 - 1200 ohm, 1/2 W
BR1 - Bridge Rectifier (ECG 5310 or equal)
K1 & K2 - 9 volt, 500 ohm coil (Radio Shack 275-004 or equal)
T1 - 600:600 ohm, split windings transformer (Stancor A4350 or equal)

Is "NFR" Real ?

By George Yazell

This is my fifth article in Radio Guide, and I still receive phone calls from people who think I'm a "crack-pot" or practical joker. I have just re-read the four previous articles to see where I failed to clear up any doubts as to my sincerity. I came to the conclusion that I tried to cover too many details in too short a space. Even after reviewing all four articles in one sitting, I was still confused - - and I wrote the stuff!

The 28 page booklet I've prepared does a much better job of "selling" NFR. That is what I am trying to do. I do not claim to have found the best or only way to bring Noise Free Radio to the AM Broadcast Band. But, I have found a workable method of adding frequency modulation to an AM transmitter, without eliminating your present amplitude modulated programs.

My suggestion is, order the NFR Booklet for $12.00, shipping and handling included. Read it through. If you feel you did not get your money's worth, return it within 30 days, and I'll send you a $10.00 refund.

Now, let me try to condense the NFR idea into a few paragraphs that make sense.

An Amplitude modulation detector in a radio receiver does not (at least it should not) respond to changes in carrier signal frequency. It will also ignore interfering signals on the carrier frequency and nearby adjacent frequencies, if those interfering signals are not varying in amplitude or are much weaker than the carrier strength of the desired signal. A signal strength ratio of 20 to 1 is usually satisfactory!

A frequency modulation detector does not (should not) respond to changes in carrier signal amplitude. It will ignore interfering signals on the carrier or nearby adjacent frequencies if the interfering signals are only slightly weaker than the desired signal. A signal strength ratio of 1.5 to 1 is usually satisfactory!

It is possible to transmit both amplitude and angle modulation simultaneously on a standard broadcast band transmitter. Motorola C-Quam Stereo does that.

In the FM Broadcast Band, channels are 200 kHz apart, and 100% modulation is defined as +/- 75 kHz deviation. The carrier may be modulated by "audio" signals from 30 Hz to 67 kHz. We are all familiar with the high fidelity, noise free, interference free service delivered to our homes by this magnificent medium.

In the AM Broadcast Band, channels are only 10 kHz apart and the FCC is proposing new rule changes that will limit the "audio" frequency range of the modulating signals to a maximum of 10 kHz. In today's AM radios, the audio frequency response is limited to about 3.5 kHz, and the noise and interference is so bad that you really have to be very interested in the program material to subject your ears to the irritating sound of an AM Radio!

Now I suggest you add NFR (Noise Free Radio) to your AM Broadcast Band transmitter. I promise that NFR will deliver an audio signal with all the high-fidelity, noise and interference free characteristics of FM, through your present AM Broadcast Band transmitter! Not only that, you can add NFR to your AM transmitter in addition to your present AM programming! No wonder some people think I'm "nuts".

If I have such a valuable idea, why don't I get a patent on it and make millions? There are two reasons. First, I have neither the dollars nor the years to complete that job. Second, everything NFR needs has already been done, or is being done now!

Early FM transmitters used phase modulated crystal controlled oscillators operating on frequencies between 102 and 125 kHz. Audio frequencies between 30 Hz and 15 kHz were applied with a maximum deviation of +/- 87 Hz (that's a modulation index of .006). That signal was MULTIPLIED 864 times, in a series of frequency multiplier stages, amplified to several kilowatts and radiated on a carrier frequency between 88.1 and 107.9 mHz. Please note that the carrier was MULTIPLIED 864 times, the amount of deviation was MULTIPLIED 864 times, but the modulation frequencies remained the same - - 30 Hz to 15 kHz.

In a typical system, a crystal controlled signal on 117.0138 kHz was phase modulated to a deviation of +/- 87 Hz, multiplied 864 times to 101.1 mHz, +/- 75 kHz. The transmitted signal was picked up by an FM receiver, converted (heterodyned) to an intermediate frequency (IF) of 10.7 mHz, +/- 75 kHz. The IF amplifier incorporated a series of limiters which wiped off all amplitude modulation and noise impulses. The demodulator (discriminator, ratio detector, etc.) "captured" the desired signal, ignoring weaker signals on the same or nearby adjacent channels. The end result - - FM radio.

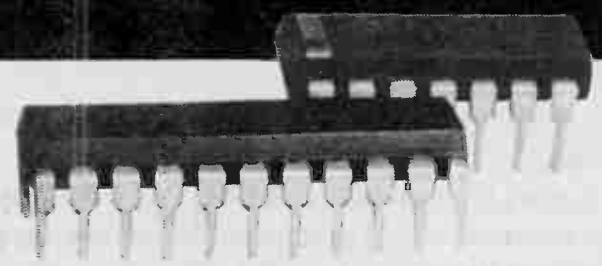
Now comes NFR! If we could apply FM to a 101 kHz oscillator, we most certainly can generate an FM signal on 1010 kHz in the AM Broadcast Band. My first model did just that. I applied audio with a frequency deviation of +/- 3 kHz (my "transmitter" was actually a Leader Function Generator).

Obviously, we need a special receiver to pick up the NFR signal. I modified an existing receiver as follows. The RF amplifier picked up the 1010 kHz, +/- 3 kHz, signal which was converted (heterodyned) to a new IF frequency of 430 kHz, +/- 3 kHz. This IF signal was then MULTIPLIED 25 times to a second IF of 10.75 mHz, +/- 75 kHz. This new signal was then injected into an existing FM IF circuit in the radio, where it was limited, demodulated and then delivered an audio signal to the speakers that was identical to "regular" FM mono audio in every respect.

I may be a little "kookie", but I'm not "nuts". NFR works and can salvage a sick AM Broadcast industry. I need your help. Read my book. Then phone or write me your suggestions as to how we can get NFR on every AM radio transmitter and an NFR radio in every home and car in the USA. Thanks!

George W. Yazell, PE, (retired)
P.O. Box 8086
Lakeland, FL 33802
(813) 682-2270

These 2 new ICs and RAMKO RESEARCH have just changed the whole concept of Broadcast Audio!!



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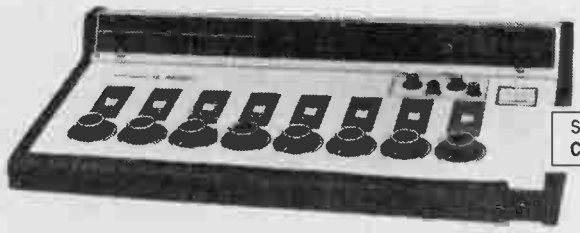

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❑ **xL41S** (4 mixer, single channel) $1295. **xL42S** (4 mixer dual channel) $1450. **xL61S** (6 mixer, single channel) $1795. **xL62S** (6 mixer, dual channel) $1950. **xL31S** (8 mixer, single channel) $2595. **xL82S** (8 mixer, dual channel) $2850.

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❑ **xL4S/8M**-$195. **xL8S/16M**-$360. Call for option prices.

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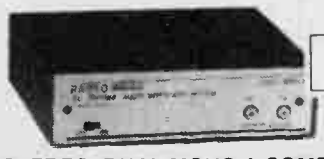

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Interfacing Transmitter Remote Status Indicators

By Michael D. Brown - Radio Broadcast Consultant
Portland, Oregon

The phone rings... It's 3:20 a.m... The nervous voice at the other end is the new weekender the PD forgot to tell you about, and he's got a problem. "I can't hear myself on the air", he says. "Is the transmitter on?", you mumble, trying gamely not to further awaken the bed-mate groaning next to you. "How can I tell?", he innocently inquires..... As you pause to take a deep breath, you realize that you've been here before, more times than you care to admit.

When it comes to transmitter remote control, the KISS (Keep It Simple, Stupid) applies in spades. Whatever the system consists of, it must be understandable in 10 seconds or less by the entire collection of gorillas, gagglers, and short-attention-span- specialists that your station likely includes. I've found that nothing meets this criteria better than "pretty red lights" status indicators. Interfacing these at the transmitter site is where the trick begins.

The status inputs on most remote control systems require a dry contact closure to ground, floating at no more than +5 volts when in the "relaxed" mode. The dilemma, of course, is that most transmitters fail to provide external dry contacts for any function, except perhaps for overload conditions. The typical solution commonly is to either or ignore the need for status indications, or to install a klugy conglomeration of relays.

Figure 1

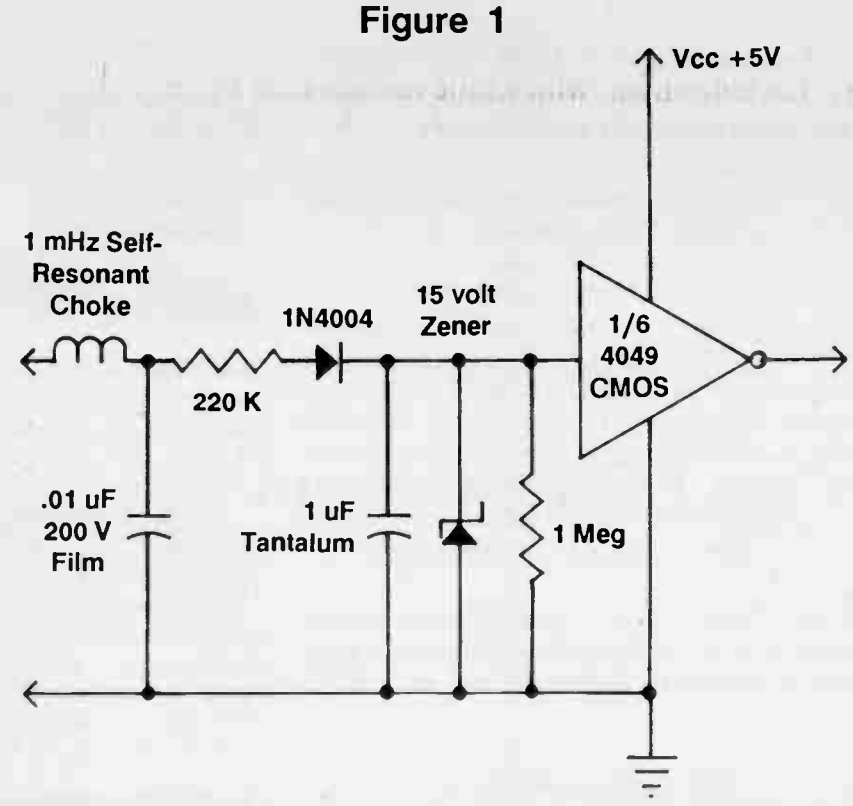


Figure 1 shows a simple universal circuit providing a "logic-low" output for any voltage input of 4 to 120 volts, AC or DC, that can be referenced to ground. And because the input impedance exceeds 1 megohm for input voltages below about 10 volts, this interface can usually be tied across metering samples without loading problems. Virtually any status indication imaginable can now be easily interfaced. (Note: The 4049 and 4050 family of CMOS buffers and inverters accept inputs of up to 20 volts, with any allowable VCC.)

Hookup for most of the indications desired is usually a simple matter. The popular Continental 315R-1 5 kW AM transmitter, for example, provides switched +28 V sources on a barrier strip (A7TB1), which were intended for external indicator lamps for filament-on, high and low power plate-on, etc.

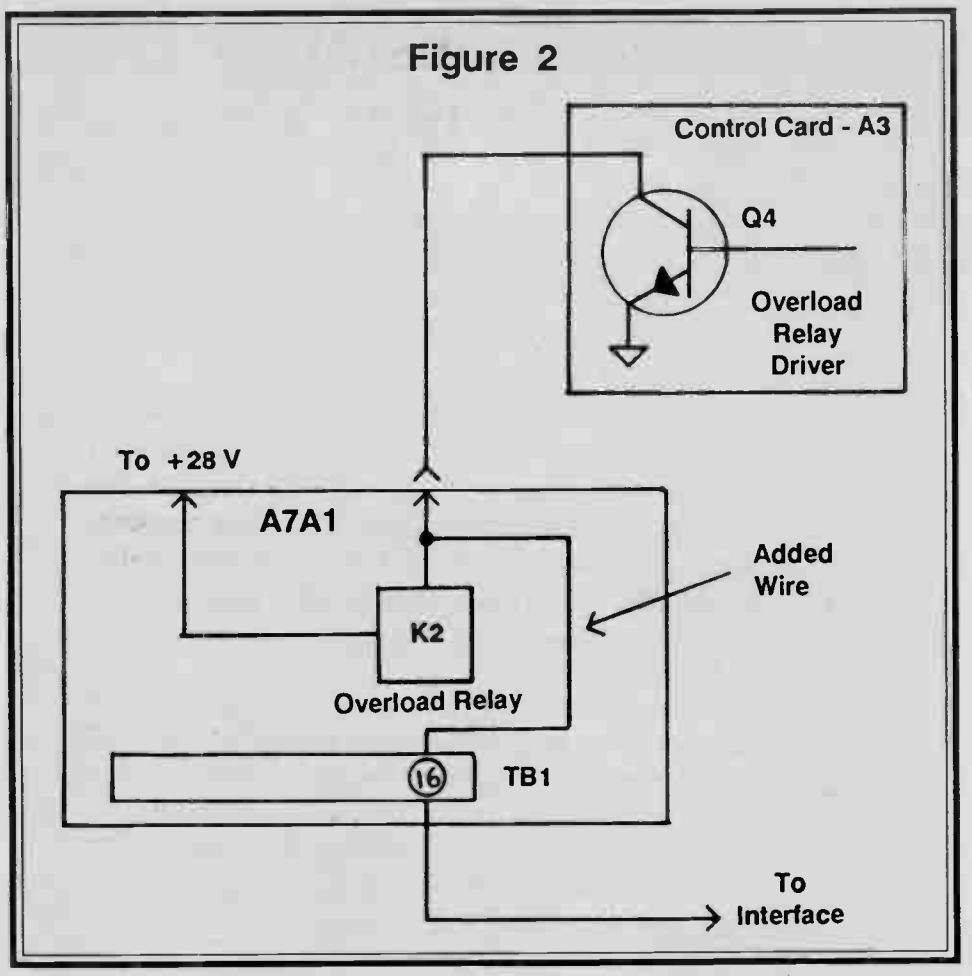


Figure 2 illustrates a simple modification to achieve a remote overload indication on the 315R-1. Overload relay driver Q4 is turned on during an overload condition, and floats at +28v during normal conditions. A wire added from the switched side of K-2's coil to the unused TB1-16 barrier strip point, provides very clean access for this indication. The sample will, however, be inverted; ie: the input to the status interface will be high during "normal" non-overload conditions. The "inverted" programming mode on the Moseley (and many other) remote control units will solve this dilemma. Otherwise, another 4049 CMOS section can be added to "re-invert" the indication. With a little thought (and some minor modifications), most other transmitters can be similarly interfaced.

Michael Brown is a Radio Broadcast Technical Consultant in Portland, Oregon. He can be reached at 503-245-4889. Your feedback is encouraged.

Cart Deck Solenoid Tip

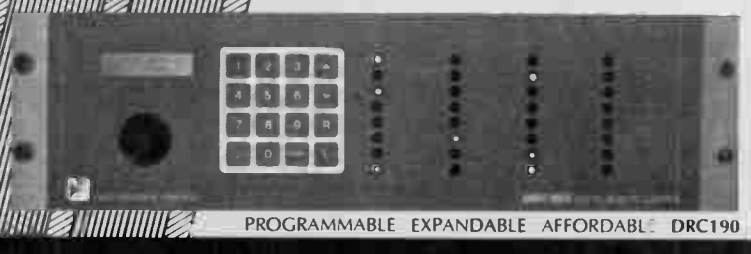
From Ray Thompson - KDKB
Mesa, Arizona

Ray Thompson called the other day and told me of a very helpful tip on troubleshooting cart decks.

Many of the older cart decks, such as ITC Criterion, have high voltage solenoids. Ray has found that, when in operation, some of these decks will have a higher than normal hum level in the audio output. If there is a large enough ripple component on the DC solenoid supply, the solenoid will induce hum into the head - -right through the air. Sort of like holding a de-gausser near a tape head, it seems.

A quick check is to disconnect the wires to the solenoid and place the deck into "play". Then manually bring up the solenoid to drive the tape. If the hum is not there, then the solenoid supply bears checking. Ray has found that a ripple of 1.5 VAC or less is usually OK; if it gets much above 2 VAC, it's audible.

Editor . . .



Cart Deck Timer Interface

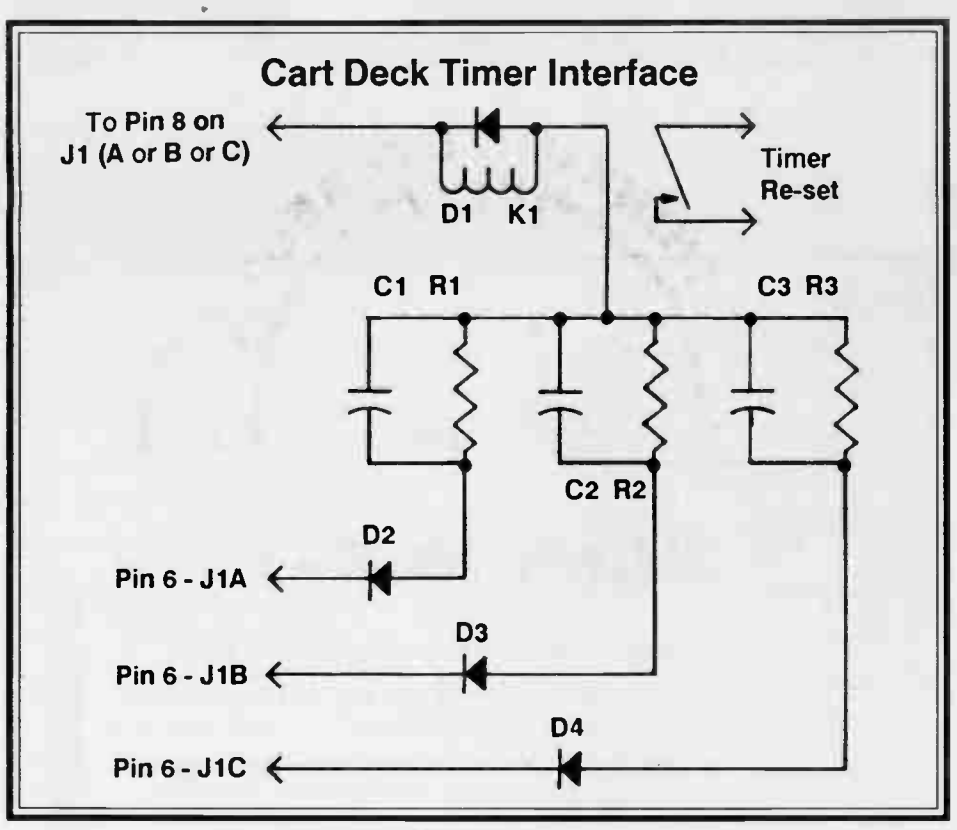
By Kevin Larke - WKYO/WIDL-FM
Caro, Michigan

Here is a timer re-set circuit that works without remote start buttons. I have used it on three triple-decks (ITC-3D), so far. It gives a brief contact closure every time a deck is started. The brief closure ensures the exact elapsed time reading every time.

I've noticed that many stations use remote push-buttons with multiple contacts, or an SPST button controlling a multiple contact relay for remote starting and timer re-setting. This works OK, but requires more parts and if the jock holds the remote start button in for a second, the timer stays at zero for too long a time. Figure 1 is a drawing of the circuit:

K1 is a 12 Volt reed type relay available at Radio Shack. Diodes D1-D4 are 1N4002 types (actually 1N4001 to 1N4007 will work). Capacitors C1-C3 are 4.7 uF/35 Volt. Finally, the 3 resistors R1-R3 are 100K.

It's very simple. When a deck is started, its pin-6 drops to ground, charging the capacitor through the relay coil. The current, at the first instant, is high enough to close the contacts of the relay for a quick blip. When the deck stops, the capacitor discharges through the 100K resistor. The supply is 24 Volts and the relay is rated for 12, but it only receives 24 Volts for an instant so the relay won't be damaged. This circuit has been in use for a few years without a failure.



Your Help is Needed ... and Appreciated

If we're doing alright, let us know. If we're not serving your needs, let us know that too - - and at the same time be sure and tell us what you think needs correction, modification or expansion.

Remember, Radio Guide depends upon your suggestions for its content, direction and its very existence. You've said you've wanted it, so here it is. Please, help to create a useful technical publication.

Give me a call at (507) 280-9668 and we'll talk.

Thanks,

Ray Topp - - editor

Slate Cue Oscillator

By R.F. Balonis - WILK
Wilkes-Barre, Pennsylvania

In today's radio engineering world, sometimes it's the little things that you do that count the most. It's the things that money can't buy that will let everyone know you were there. This project is like that. For any one who does audio production, a Slating Cue Oscillator built into the production console is worth far more than the cost of its parts.

Slating is a term and practice taken, I think, from the film industry. Before each "take", a slate board with a take number written on it is held in front of the camera, prior to the shooting. In the recording industry (broadcasting too), the "slating" is a spoken "take 1" or "take 2" before each cut.

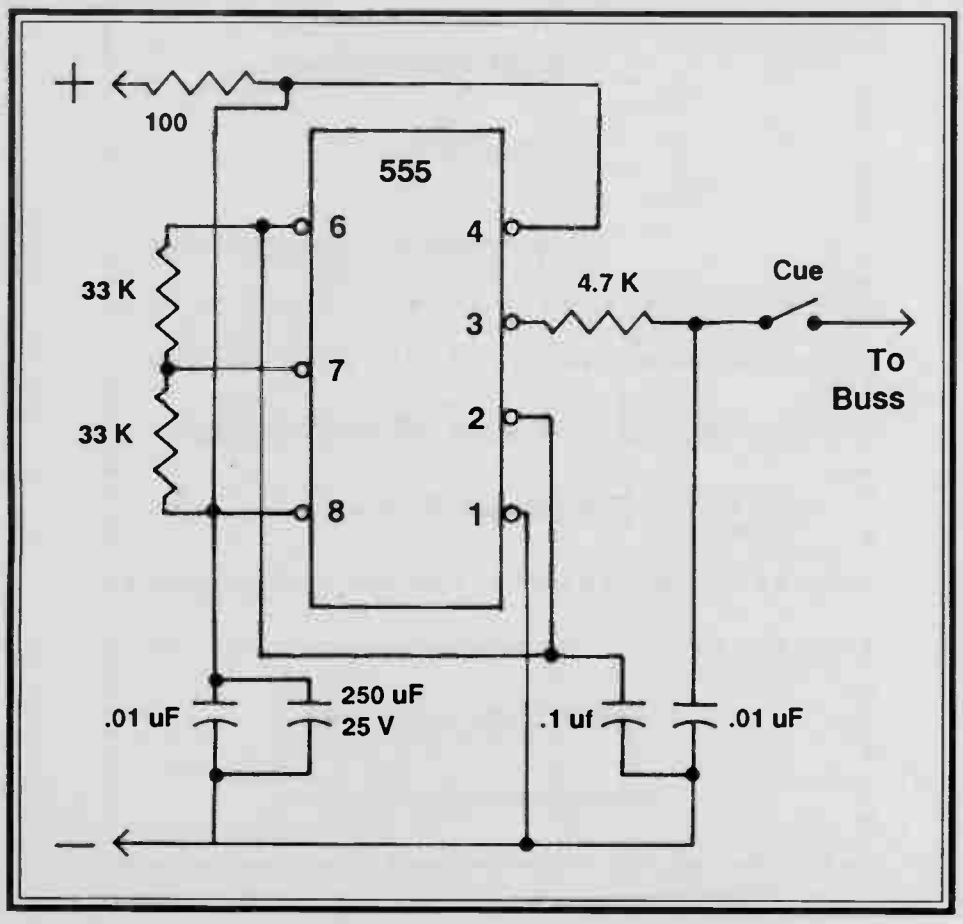
That works real good at normal playback speeds, or with few cuts on a tape. However, at fast forward or rewind, finding the talk-only slate mark can be difficult and sometimes frustrating.

That's the reason for this project. A Slate-Cue Oscillator lets the announcer (or whomever) add a harmonic rich tone to each aural slate mark. Aural slating with a short tone mark added to it, is heard as a series of high pitched tones marking the beginning of each cut, as the tape is run at fast forward or reverse. Finding a cut is simply a matter of counting the beeps.

Most any low frequency oscillator can work to generate a slate-cue tone. But I think a harmonically rich, distorted one, works better; and a built-in one for slate cue at the press of a button, best of all.

At the heart of this project is one of the standard IC building blocks, the ubiquitous 555. It is a common IC now-a-days and is in most radio station spare parts boxes. The 555 IC was originally designed for timer applications and with a minimum of parts it can function in either astable (oscillating) or monostable (one-shot) modes.

None of the parts have critical values, just about anything in the ballpark (junkbox) should work. The 33K resistors and the 0.1 mFd capacitor determine the frequency. The 4.7K resistor and the 0.01 mFd capacitor on terminal-3 filter the square wave a little before it's output runs thru the Slate-Cue pushbutton to tie into the console's mixing buss. 10-15 volts power is borrowed from someplace.



Tips From The Field

Technical Tips From Around the Country

Modulation Peak Problem

By Carl Fletcher - WAKE/WLJE
Valpariso, California

Recently, I came across a modulation problem with my AM transmitter; the positive peaks were 5 dB greater than the negative peaks. Since all audio stages were push-pull, I immediately thought something was wrong with the positive half of one of the audio amps, or possibly the modulation transformer. Actually everything associated with the audio portion of the transmitter was suspected.

After 5 hours of changing coupling capacitors and tubes, taking measurements and staring at schematics, I noticed that one of the RF final tubes was intermittently glowing slightly dimmer than the other tubes. "What now?", I thought, making no connection between this and my modulation problem. After a brief inspection, a loose filament connection on the tube socket was found and quickly fixed.

When the transmitter was put back on the air, the modulation problem had disappeared. The bad filament connection on the RF final had caused the problem. This experience taught me two lessons. First, rock solid pre-conceived notions can lead you a long way down the wrong path. And second, never under-estimate the value of a good thorough visual inspection.

Fuse Tip

By Jay Mitchell - WENN
Birmingham, Alabama

Our Harris Executive console would not work long without blowing the monitor amp fuse. One way we approached the problem, was to replace the fuse with a light-bulb, at the current and voltage rating of the circuit. When the short occurred, the bulb would light and not burn up parts or the PC board. This worked so well that you could short any diode in the bridge rectifier and the bulb would light (the amplifier would still work, with hum). This allows you to take time to work on the unit without fanning smoke out of your face. This idea should work in other equipment.

No Audio

By Earl Fletcher - KTAN/KATZ
Sierra Vista, California

The transmitter equipment of KTAZ(FM) consists of a Harris FM-2.5 H3 FM transmitter and a Wilkinson Series 8090 Model X FM Broadcast Exciter.

Recently we had trouble with intermittent audio. While the audio cut off, the carrier remained on the air. When the transmitter final was cut off, the audio would re-appear at the output of the exciter. Coordination with the Wilkinson (TTC) customer engineer, suggested replacement of the coaxial cable between the audio mixer module and the modulation oscillator module. The cable was replaced and the audio problem solved. Is is assumed that the vibration from the PA blower motor was causing an intermittent failure of the exciter cable.

Please-We Need Your Help!

If you have any short tech-tips, send them in or better still, call me at (507) 280-9668 and we'll talk about them. Remember, it doesn't do anyone any good if you keep that information to yourself. Don't assume that everyone knows about your special technical tip. Send them in - - they'll be printed in the next issue.

Editor . . .

Contract Engineers

Radio Guide will provide space here for contract engineers wishing to expand their business. To be listed here, just give me a call at (507) 280-9668.

This list is not a recommendation of any particular engineer. You will have to determine for yourself the qualifications of a particular person for the job.

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Miami, Florida
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Peter C.L. Boyce
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New Albany, Indiana
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James Boyd
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Mike Brown
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Transmitter With a Heart

By Walter Bolinger - KJCR
Keene, Texas

At KJCR we operate a Continental 1 kW FM transmitter in stereo. The studio is a couple of blocks from the transmitter site and a Marti STL gets the signal to the transmitter. Recently, one of the on-air operators called me and said that there was a funny sound going over the air. By the time I could get to the station, it was no longer present. Some time later, I was called again. This time I could hear it, but only during the gaps in program audio.

They called it a "heart-beat", and it did sound a little like listening to the heart with a stethoscope. It was a low frequency, repetitive sound and my first thought was that it was motor induced. I checked the various motor driven equipment in the studio, but no change. I decided that the problem would have to be run down when the station was off the air.

The next morning at 2:00 a.m., I got up and went to the studio. The sound was there, even when the station was off the air. We do keep the filaments on all the time, and this keeps the exciter on too (great for frequency stability). The STL operates continuously, so I turned it off and the "heart-beat" was still there. I had noticed that the blower motor on the transmitter had gotten noisier lately, so I began to figure that the trouble might be related.

I went to the transmitter site and lubricated the motor, but no change. I turned the exciter off and the noise stopped. With the exciter back on, I started wiggling the cards in the exciter and shortly, the noise was gone. I turned the exciter off and gave all the contacts on the cards a cleaning. Now, several weeks later, the "heart-beat" has not returned. I figure that some of the contacts were a little dirty and the vibration from the blower was enough to modulate the signal and produce the noise.

Radio Guide

January, 1989 Volume 2 - Issue 1

Mail to: Radio Guide 511 18th Street SE
Rochester, MN 55904

Fill out the information below, and then circle the number of any manufacturer from which you would like additional information.

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