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Broadcasters' Desktop Resource

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... edited by Barry Mishkind – the Eclectic Engineer

The Maintenance Shift Solving the SX Metering Problem



By Michael Patton

[January 2016] Keeping an older transmitter on line is always a bit of a dance – balancing operating and parts costs versus the amortized costs of a new unit. But when the transmitter has been reliable and relatively inexpensive to operate, a decision to repair is easier in many cases. Mike Patton has a solution for one of the more difficult decisions some owners have had to face.

The Harris SX transmitter series, in production from 1983-1990, was quite popular, and Harris sold hundreds of units, here and abroad. SX units continue to be found in reliable primary and backup service at many of those stations.

However, there has been one issue in particular which has dogged every SX series transmitter they ever made: the partial or total failure of the digital alphanumeric display units made by Texas Instruments.



These displays have proven to be terribly unreliable. Today, most displays in SX transmitters are missing at least one segment – if not whole digits. In fact, TI declared them obsolete many years ago and, essentially, they have been unobtainium for several years now.

NOT THE BEST DESIGN

Even when the original display worked right, using it was cumbersome at best.

The display showed only a 2-digit code for each channel/ reading, requiring a user to have a chart of channel numbers to have any idea which reading was for what parameter. Then, another chart was required to see what the normal readings should be. Yet another chart was needed to decode the meaning of overload displays.

When the displays start to lose segments or even whole digits, the cost of finding replacement parts can be truly frightening; just one TIL308 digit display (and there are 16!) can cost from \$80 to \$250 on the surplus (read: quality unknown) market.

Without a fully working display it is very hard to troubleshoot these transmitters. The alternative is for one to defeat interlocks in order to make the necessary direct measurements of voltages and waveforms, hence compromising their physical safety.

It is safe to say this display has frustrated more than a few engineers over the years.

DESIGNING & BUILDING A SOLUTION

Over the years, as the original SX displays began to fail, factory support was discontinued, and parts stocks disappeared. Michael Patton & Associates saw a clear need for a better solution.



The MP&A SX Display

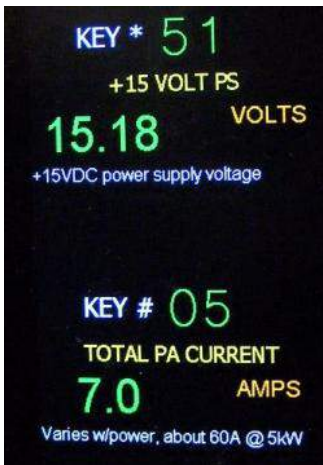
MP&A considered several ways to develop a better retrofit display for the SX transmitters, looking at various LCD and LED displays – finally settling on a very nice color LCD display that is both large and bright.

We were able to find a way to scan the 4-bit data bus feeding the old display into a modern micro-controller. Then we set about writing the code that would bring it all to life. Many long hours and empty pizza boxes later, we are happy with the product we created – and I feel sure that you will be, too.

MP&A is now shipping our retrofit color LCD display units for Harris SX transmitters!

BETTER THAN THE ORIGINAL

Our retrofit display has been designed to solve the problems with the original displays, as well as to provide greatly enhanced functionality, and resist partial or total unit failure.



The display lists the channel name in plain text.

It also can show a normal reading and an expanded legend for the chosen channel.



Troubleshooting and routine maintenance calls are now much easier with our new display.

You can get a clear indication of the what's and the when's that happened between the transmitter and the system.

EASY INSTALL RETROFIT CARD

Installing the new display could not be easier.

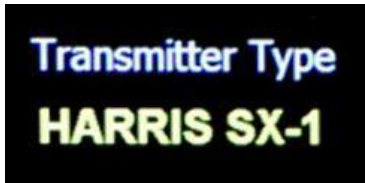
The display mounts onto the old unit's mounting studs and plugs right into the ribbon cable.



Once installed, you can either reuse the old keyboard, which will solder onto matching pins on the new display, or we can supply a new keyboard with the new display.



Among the few choices you have upon installation, our units have jumpers to select the type of transmitter (1, 2.5, or 5 kW), and the proper normal values for the transmitter it is installed in.



Units are now in stock for immediate shipment. The price is \$795. Call or email us to secure your order.

Michael Patton is an industry veteran known for tackling hard-to-repair gear. He is the owner of [Michael Patton and Associates](#) in Baton Rouge, LA. Or call 225-752-4189.

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