VHF-UHF DIGEST
The Magazine for TV and FM DXers
January 2017


ChannelMaster 4220HD
on portable 17' tripod

WTFDA FM DATABASE IS BETTER THAN EVER

ROUND THREE OF FORWARD AUCTION FAILS

THE DESPICABLE Q.R.M., ARCHVILLIAN OF ALL DXERS, RETURNS TO HIS LAIR AND SCHEMES "NEXT TIME DXERS, ALL YOUR OPEN CHANNELS SHALL BE *MINE*!"

The Official Publication of the Worldwide TV-FM DX Association

INSIDE THIS VUD

CLICK TO NAVIGATE

DX REPORTS/PICS FROM: Andrew Knafel (OH), Jim Thomas (MO), Bob Seybold (NY), Fred Nordquist (SC), Doug Smith(TN)

THE WORLDWIDE TV-FM DX ASSOCIATION

Serving the UHF-VHF Enthusiast

THE VHF-UHF DIGEST IS THE OFFICIAL PUBLICATION OF THE WORLDWIDE TV-FM DX ASSOCIATION DEDICATED TO THE OBSERVATION AND STUDY OF THE PROPAGATION OF LONG DISTANCE TELEVISION AND FM BROADCASTING SIGNALS AT VHF AND UHF. WTFDA IS GOVERNED BY A BOARD OF DIRECTORS: DOUG SMITH, GREG CONIGLIO, KEITH McGINNIS AND MIKE BUGAJ.

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The Mailbox

PAGE TWO

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Mike Bugaj - Enfield, CT mikeb@wtfda.org

JANUARY 2017

Dues Received

DATE RCVD	NAME	S/P	ENDS
11/27/2016	Ted Liscewski	NJ	11-17
11/28/2016	Marcus Barboni	PA	11-17
12/12/2016	Paul Mitschler	NM	1-18
12/12/2016	Gary Olson	FL	1-18
12/15/2016	Russell Lay	NC	11-17
12/15/2016	William Norris	IN	12-17
12/15/2016	Chester Jaffee	CA	12-17
12/20/2016	James Niven	TX	12-17
12/20/2016	Gary Cumiskey	MA	1-18
12/21/2016	Tom Bryant	TN	12-17
12/24/2016	Chris Lucas	NY	12-17
12/24/2016	Russ Edmunds	PA	12-17
12/24/2016	Barry Bauer	DE	12-17
12/24/2016	David Wurl	WI	12-17
12/28/2016	Adam Rivers	CT	12-17

Welcome to Gary Cumiskey, Bridgewater, MA, our newest WTFDA member. Welcome, Gary and thanks to all of you for your support of the WTFDA. Without you, there's no club.

Forward/Reverse Auction Progress

Stage Three of the FCC's Forward Auction closed in early December after a single round without success. Stage four began a few days later and will end at the end of January.

What this means for us Dxers is that ch36 is now safe from being taken by the wireless companies, and if stage four also closes without acceptable bids, ch38 and below will also be safe and the auction moves to stage five. If a stage five auction also fails, ch39 will also be safe. If the auctions progress through stage nine and stage nine does close, channels 45 through 51 will be taken but if stage nine does not close with acceptable bids, then nothing is taken and the auction process would be seen by many as a total waste of time.

The Brazilian DTV Transition

Ivan Dias tells us the following: FYI: the first Brazilian city to switch off analog TV signal was Rio Verde, in Goiás state. During 2017, cities with less than a million inhabitants will have the analog signal switched off. In the end of 2018 the remaining cities will have the analog signal switched off. During the analog signals days, the VHF band was used in bigger cities and UHF in the smaller ones. Now, everything will be in UHF band.

DANNY

This message was posted on the email list by Fred Nordquist and received from Danny Oglethorpe: “Please forgive me for not being in contact with you or anyone else. Thanks for your concern and prayers. In spite of nerve problems, health problems, and financial problems, by the grace of God, I will soon return. I'll be in touch with you soon.”

A Lousy Antenna Review

No, it’s not a lousy review. It’s a review of a lousy antenna submitted by Karl Zuk: A co-worker of mine recently purchased an Xtreme Signal HDTV 4 Bay Bowtie Outdoor TV Antenna 50 Mile VHF/UHF (HDB4X). This is the very inexpensive line sold by Solid Signal and others.

Buyer beware. This is a very, very inexpensive antenna made for only the most undemanding use.
If you need a very casual UHF antenna for mounting in an attic or otherwise enclosed space, this may meet your needs.

It uses very basic fine rivets and thin aluminum stock. The bowtie antenna pieces are thin.The horizontal rods that form the back reflector can be bent very easily. The antenna's frame is made of very cheap plastic holding the reflector rods in place. In the center is a matching transformer plastic square.

I can't imagine this surviving outdoor use for any length of time. The basic model is a two bay. The 4 bay is a combination of two 2 bays together. I presume the 8 bay version continues this idea.

We looked at the pickup pattern on a Tektronix spectrum analyzer and it could bring in some signals with reasonable linearity. We experimented about 50 feet up in line-of-sight with Manhattan.

Again, use only in attics.Never outdoors. You get what you pay for. I like Channel Master products personally.

The Radio Garden

Submitted by Al Tobia: RADIO.GARDEN is the TRE online exhibition, developed together with the Netherlands Institute for Sound and Vision and designed by Studio Moniker, that allows users to explore an interactive globe filled with radio’s past and present. Give yourself a crash course in global radio. Do you want to know what’s being played on the radio in Argentina right now? Well, thanks to a website called Radio Garden you can hear radio from there, and almost everywhere else in the world. The website takes the form of an interactive globe that can be rotated to pick up transmissions from every corner of the planet, clips from radio history and stories from listeners in different locations. While it allows you to listen to radio from around the world, it’s so exhaustive you’ll probably find stations you didn’t know existed in your own city (London’s drum and bass-focused DnB Noize, for example). The best feature however is the ability to hear different jingles from across the globe, each of which comes with its own detailed analysis of their different forms. Try it out at the Radio Garden website.
link ... http://radio.garden

WTFDA FM Station Upgrades

It took months and a few failed attempts, but the FM Database has been upgraded thanks to a Python programmer (and very nice guy) in Ohio. Users are now able to sort on both the Country field and on the parallel (//) field.

Since the database now includes stations from 14 countries (and much of Central America yet to come) we really needed the upgrade. Users can now select a country by using a pull down menu on the search screen. No longer will users find US states mixed with Canadian provinces or Mexican states in their search results.

With the // field now searchable, users can output a list of all translators of KAWZ, for instance, or enter the name of an AM station and find it’s FM translators.

Over the months we have been incorporating the contents of Emisoras de FM into the database with newer, updated information. Our efforts will continue over the winter.

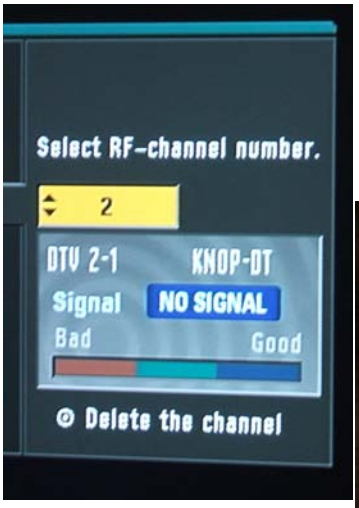
So, if you haven’t been there, wander over to the FM Database at http://db.wtfda.org and check it out. Also check the help page at http://www.wtfda.info for more information on how to use it. It’s not hard at all, even for the most inexperienced computer users.

Last But Not Least

I hope everyone had a great holiday season. We end the year with around 205 members. There are big changes coming over on the TV DX side and there’s no telling how those changes will affect membership.

The Facebook group is almost at 600 members. As is with most Facebook groups, 90% of the group members never post anything. We assume they read the posts and learn something about the hobby and the WTFDA members who post there are great teachers!

See you all next month! -Mike



TV News

Douglas E. Smith
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http://www.w9wi.com

January 2017

Abbreviations:

Aux	**Aux**iliary (backup) transmitter
FTP	**F**ailure **t**o **P**rosecute
ROA	**R**equest **o**f **A**pplicant
STA	**S**pecial **T**emporary **A**uthority
LPDTV	**L**ow **P**ower **D**igital **TV**
DRT	**D**igital **R**eplacement **T**ranslator

News:

(full-power digital stations in **bold face**; LPTV and translators in regular type; full-power analog stations in ***bold italics*****;** low-power analog stations in *regular italics*)

Location	*RF Ch*	*Callsign*	*Notes*
Alabama			
Sylacauga	38	W38EI	Converted to digital, 9kw, 33-10-09/86-14-56
Tuscaloosa	21	W21DM	Requests power increase to 10kw, 33-29-04/86-48-25 (WTTO tower, Homewood)
Alaska			
Delta Junction	11	K07NJ	Granted power reduction to 560 watts, 63-47-21/145-51-31 (Fort Greely); on the air.
Fairbanks	13	KXDD-CD	Call changed from K13XD
Fairbanks	22	KFXF-LD	Call changed from K22EY
Ketchikan	**13**	**KUBD**	**Granted Special Temporary Authority for 180w/-130m, 55-20-59/131-40-28, to allow the station to move to a new site while waiting action on permission for permanent use of the new site.**

Location	*RF Ch*	*Callsign*	*Notes*
Sitka	**7**	**KTNL-TV**	**Granted Special Temporary Authority for 150w/-208m, 57-03-07/135-19-59, to allow the station to move to a new site while waiting action on permission for permanent use of the new site.**

Arizona

Littlefield	30	K30IP a.k.a. KZVE-LD	License cancelled; has separate permit for Digital Companion Channel on 17.
Sierra Vista	*20*	*K20FO*	*Requests power reduction to 42kw, 31-28-53/109-57-32 (Bisbee)*

California

Banning	5	KRVD-LD	Site changed to 34-11-17/117-42-12 (Brindle Mtn., San Antonio Heights)
Cloverdale	11	K11WP	Requests power reduction to 4 watts, 38-30-32/122-39-44 (KXFX-FM, Santa Rosa)
Cloverdale	13	KQTA-LD	Power reduced to 4 watts, 38-30-32/122-39-44 (KXFX-FM, Santa Rosa); Requests site change to 38-19-56/122-35-40 (Sonoma Mtn.)
Durham	36	K36LY	Requests power reduction to 1kw, 39-39-14/121-28-26 (Berry Creek); granted & on the air
Hemet	21	KDUG-LD	Converted to digital, 1 watt, 33-12-17/117-03-19 (Valley Center).
Redding	8	KVFR-LD	Requests power increase to 1.5kw, 40-39-05/122-31-32 (Iron Mountain)
Redding	25	K25LN	Request to move from K33HH, 5.65kw, dismissed
Sacramento	**21**	**KMAX-TV**	**Requests power change to 545kw/606m, 38-14-24/121-30-03 (KXTV/KOVR tower, Walnut Grove)**
Santa Rosa	3	K03IC	Requests power reduction to 5 watts, 38-19-56/122-35-40 (Sonoma Mountain)
Walnut	40	KRMV-LP	Requests power reduction to 300 watts, 34-11-17/117-42-12 (San Antonio Heights)

Connecticut

Hartford	38	WHCT-LD	Requests power increase to 15kw, 41-29-46/72-37-07 (Middletown); granted

Delaware

Georgetown	42	W42EI	Requests power increase to 12kw, 38-30-17/57-38-37 (Laurel)
Rehoboth	33	W33DP	Requests power reduction to 295 watts, 38-55-50/74-55-15 (Marquis de Lafayette Hotel, Cape May, N.J.); granted

Location	RF Ch	Callsign	Notes
			
Florida			
Fort Myers	20	WLZE-LD	Moved from channel 51, 15kw *confirmed by VUD editor ;)*
Key West	5	WFIB-LP	Call changed from W05CJ
Panama City	*12*	*W12DE*	*License cancelled*
Panama City	24	NEW-lptv	Application for new station, 5kw, 30-21-14/85-54-27 (EICB-TV East) (West Bay)
Tallahassee	29	NEW-lptv	Application for new station, 15kw, 30-34-42/84-15-48 (EICB-TV East)
			
Georgia			
Augusta	35	WFCU-LD	Power increased to 15kw, 34-54-00/82-24-46 (Greenville, S.C.)
Chatsworth	**33**	**WNGH-TV**	**Power changed to 400kw/550m, 34-45-02/84-42-52**
Cochran	**7**	**WMUM-TV**	**Power changed to 38kw/227m**
Dawson	**8**	**WACS-TV**	**Tower height increased to 334m**
Waycross	**8**	**WXGA-TV**	**Tower height increased to 311m**
			
Hawaii			
Honolulu	48	KHHI-LD	Requests site change to 21-19-45/157-53-18
			
Idaho			
Boise	14	NEW-lptv	Application for new station, 10 watts, 43-45-21/116-05-54 (EICB-TV East)
Boise	16	KKIC-LD	Converted to digital, 15kw
			
Illinois			
Ottawa	29	WSPY-LD	Power increased to 11.1kw, 41-39-54/88-34-33 (WSPY radio site, Plano)
Rockford	22	W22EE	Granted power reduction to 4.8kw, 42-17-46/89-10-15 (WIFR-TV facility)
Springfield	45	WODK-LD	Power increased to 8.7kw, 38-26-14/90-28-40 (High Ridge, Mo.)

Location	RF Ch	Callsign	Notes
			
Iowa			
Keokuk	*46*	*K46IH*	*License cancelled*
Sioux City	14	KBWF-LD	Granted site change to 42-28-21/96-25-20 (South Sioux City, Nebr.); site changed; call changed from K14NV
			
Kentucky			
Bowling Green	14	W14DG	Granted power increase to 4.8kw, 36-57-37/86-29-36 (WBKO-TV studios)
Jamestown	*9*	*W09CQ*	*License cancelled*
			
Maryland			
Salisbury	*7*	*WNGA-LD*	*License cancelled*
			
Massachusetts			
Boston	**20**	**WCVB-TV**	**Granted Special Temporary Authority to operate at reduced antenna height of 357m due to antenna failure. Station briefly operated at 32kw/305m. WCVB will probably be back to full power/height by the time you read this.**
Boston	**30**	**WBZ-TV**	**Granted Special Temporary Authority to operate at reduced antenna height of 375m and power of 567kw due to antenna failure.**
Lawrence	**18**	**WMFP**	**Has added NBC on 60.5 (yes, 60, not 62) parallel WBTS-LD. See text.**
			
Michigan			
Escanaba	*11*	*W11CZ*	*License cancelled*
Escanaba	*25*	*W25DX*	*License cancelled*
Ironwood	32	W32CV	Granted conversion to digital, 8.452kw; on the air

Location	RF Ch	Callsign	Notes
			
Mississippi			
Columbus	20	New-lptv	Application for new station, 15kw, 33-33-00/88-23-59 (EICB-TV East)
Jackson	*46*	*W46CW*	*License cancelled*
Laurel	*4*	*W04DE*	*License cancelled*
			
Missouri			
Jefferson City	*5*	*K05LU*	*License cancelled*
Joplin	39	KZLL-LD	Power reduced to 2kw, 36-07-52/96-04-13 (Tulsa, Okla.)
Moberly	*5*	*K05LY*	*License cancelled*
Saint Joseph	16	KNPG-LD	Call changed from KBJO-LD
Saint Joseph	30	KBJO-LD	Call changed from KNPG-LD
			
Montana			
Drummond	20, 26, 35, 45	K20KL, K26KA, K35JT, K45LA	Request power increase to 167 watts; granted
Great Falls	**7**	**KRTV**	**Requests power change to 32.5kw/146m**
Great Falls	19	KBGF-LD	Requests site change to 47-32-07/111-17-02
			
Nebraska			
Omaha	**17**	**KYNE-TV**	**Power reduced to 21.5kw/284m, 41-18-32/96-01-33 (KETV tower)**
South Sioux City	26	KSXC-LD	Permit granted for new station, 15kw, 42-29-05/96-18-18; Digital Companion for analog 5 (KTFC-FM tower, Sioux City, Iowa)
			
Nevada			
Tonopah	*45*	*KJKC-LP*	*License cancelled*

Location	RF Ch	Callsign	Notes
			
New Jersey			
Hackettstown	49	W49BE	Converted from analog, 1kw
Morristown	17	WNMF-LD	Requests power reduction to 135 watts, 40-45-07/73-58-03 (UN Plaza, 47th St. & 1st Ave., NYC)
			
New Mexico			
Orogrande	4	K04RK	Requests power increase to 3kw
Soldier Canyon	26	K26MV	New to the air, 1kw, 33-10-00/105-46-34 (KENW) (Mescalero) Granted power increase to 1.25kw.
			
New York			
Port Jervis	25	W25FA	New station on the air, 13.4kw, 41-00-35/74-35-38; (Sparta, N.J.) Digital Companion for W24EF
Port Jervis	28	W28ES	New station on the air, 1.87kw, 41-00-35/74-35-38; (Sparta, N.J.) Digital Companion for W49DK
Port Jervis	31	W31EF	Converted to digital from analog W46DQ, 2kw, 41-00-35/74-35-38 (Sparta, N.J.)
Watertown	45	WVNC-LD	Power increased to 9kw, 43-58-04/75-48-21 (Watertown)
			
North Carolina			
Wanchese	*6*	*WMTO-LP*	*Site changed to 36-06-12/75-49-09 (Harbinger); requests further change to 36-17-45/75-55-15 (Poplar Branch)*
			
Oregon			
Warrenton	22	KHPN-LD	Granted move from ch. 51, 15kw, 46-17-10/123-53-49 (in Washington State, just across the Columbia from Astoria)
			
Puerto Rico			
Ponce	**19**	**WKPV**	**Granted Special Temporary Authority for reduced power of 50kw due to transmitter failure**

Location	RF Ch	Callsign	Notes
			
South Dakota			
Aberdeen	**9**	**KABY-TV**	**Granted Special Temporary Authority to operate from their studio building, 45-28-20/98-30-14, with 340 watts/39m. Their normal tower had to be dismantled due to structural problems; it couldn't be rebuilt within a year. If the station remained off the air that long, its license would be forfeited.**
Brookings	40	K40FZ	Converted to digital, 7.014kw
			
Texas			
Beaumont	36	K36ID	Site changed to 30-11-25/93-53-07 (KBMT TV site, Mauriceville)
Big Spring	36	NEW-lptv	Application for new station, 15kw, 32-13-18/101-27-33 (EICB-TV East)
College Station	49	K49LC	Requests power reduction to 4.7kw, 30-38-34/96-19-53; granted (KBTX-TV studios)
Dayton	5	KTDJ-LD	Requests site change to 29-45-30/95-22-03
El Paso	48	KTDO-LP	Call changed from K48IK
Harlingen	22	KTLM-x	Requests site change to 26-09-19/97-41-28; see text
Houston	49	KEHO-LD	Power increased to 15kw, 29-48-05/95-14-03
Lufkin	42	KLNM-LD	License canceled
San Angelo	23	K23IA	License cancelled
Wichita Falls	32	KYWF-LD	License cancelled
Victoria	7	KBHO-LD	Power increased to 1.5kw, 29-18-24/96-07-48 (Wharton)
			
Virginia			
Crozet	35	W35DJ	Requests power increase to 15kw, 37-30-45/77-36-05 (WCVE-23 tower, Richmond)
			
Washington			
Maltby	45	K45NA	Requests power reduction to 8.5kw, 47-51-37/122-16-58 (Lynnwood); granted
Pullman	38	K38KK	New to air, 6kw, 46-51-43/117-10-26 (Kamiak Butte) (KXLY-TV)
			
West Virginia			
Clarksburg	13	WVUX-LD	Requests power increase to 3kw

Wisconsin

Ashland	45	W45CI	Converted to digital, 9.332kw
Eau Claire	50	W50EI	Requests power reduction to 10kw, 44-54-59/91-41-55 (Elk Mound)
Hayward	31	K31GH	Granted conversion to digital, 9.484kw; on the air
Madison	36	WZCK-LD	Power increased to 8.4kw, 43-03-09/89-28-35 (WKOW-TV studios – probably on their radar tower)
Milwaukee	29	WPVS-LP	Granted Special Temporary Authority to continue operation in analog at 148 watts, 43-29-03/87-55-19 (Fredonia)

Wyoming

Jackson	*39*	*K39JU*	*License cancelled*
Kemmerer	*46*	*K46JY*	*License cancelled*

"KTLM-x" in Harlingen, Texas is a DTV Replacement Translator. From a legal standpoint, it's an additional transmitter for full-power station KTLM (channel 40) Rio Grande City. A third transmitter exists, on channel 43 at McAllen. From an engineering standpoint, the Harlingen and McAllen transmitters are translators. All three transmitters are authorized under the same license and thus, all three share the KTLM call letters.

WHDH-7 Boston has gone independent. The NBC affiliation has shifted to low-power station WBTS-LD, RF channel 46. Somehow this station has received permission to use virtual channel 8. WBTS will also carry Telemundo (on 8.2); Cozi TV (on 8.3); and TeleXitos. (on 8.4.) All three are relayed from existing Telemundo affiliate & NBC-owned station WNEU, Merrimack, New Hampshire.

Going the other direction, WNEU will carry the WBTS NBC programming on 60.2.

Finally, to provide a better signal in the overall Boston area, NBC is leasing space on WMFP, Lawrence. (channel 62) The programming on WBTS and WNEU will air in 1080i format, but on WMFP it will air in 720p on subchannel 60.5. Yes, 60.5, not 62. It joins WMFP's 62.1 (Sonlife Broadcasting); 62.3 (The Works); and 62.4. (Comet TV) There is no 62.2.

Let's just say if you see NBC programming on an unexpected channel, it's probably from Boston(grin).

I suppose readers may wonder what effect the upcoming major political changes in Washington will have on broadcasting. My guess is "not much". I think the political changes will, in the FCC, be far more dramatic for common carriers. (telephone companies, especially wireless)

The spectrum auction is a bipartisan project. The Trump administration certainly won't kill it and I doubt they'll make any changes. There's a project to remove the prohibition on common ownership of a TV station and a daily newspaper in the same market: I suspect the turnover will ensure this succeeds. I doubt DXers will notice.

The FCC consists of five Commissioners. No more than three may be members of the same party. In practice this generally means three are members of the President's party and two of the other party. The terms of Commissioners Jessica Rosenworcel (Democrat) and Ajit Pai (Republican) have expired. (they're allowed to serve up to 18 months after expiration if replacements haven't been appointed. For Rosenworcel that period will expire before you read this. Pai could have another year.) I expect Rosenworcel will be replaced by a Republican. I haven't heard any names.

I don't recall ever having two items in Delaware in the same month:)

PHOTO NEWS

January 2017

Jeff Kruszka
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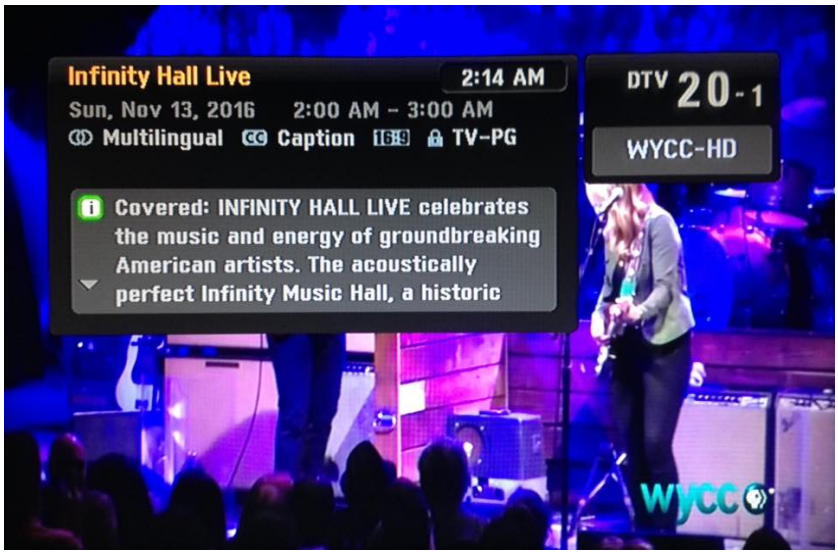
More from Andrew Knafel in Medina, OH:

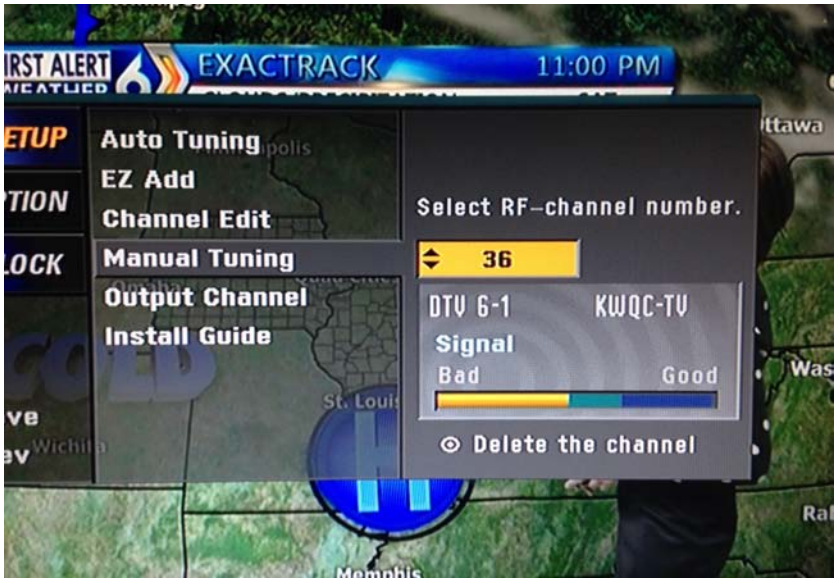
WLEX-39 Lexington, KY
255 mi Tr seen 11-3-16

WUSI-19 Olney, IL
371 mi Tr seen 11-3-16

WMLW-48 Racine, WI
343 mi Tr seen 11-12-16



WYCC-21 Chicago, IL
306 mi Tr seen 11-12-16



KWQC-36 Davenport, IA
446 mi Tr seen 11-12-16

WBUW-32 Janesville, WI
416 mi Tr seen 11-12-16

Coast to Coast TV DX

Featuring reports from the entire United States and all of Canada.

Send reports by the 15th of each month to:
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The Editor's Note

Happy New Year! We hope 2017 is bountiful for you both in "real life" and in any DX endeavors. We open the year with typically barren winter conditions across the continent – it appears a redux of last year's active Es around the New Year is not in the cards. Tropo, meanwhile, looks bound to Florida and the Gulf coast areas, as a trough builds across the Eastern U.S., again bringing the kind of weather one might expect this time of year. A nice opening in particular across the deep south occurred on the 20th and 21st of December.

We welcome a contribution from Bob Seybold, who even in a light season had some impressive logs, along with reports from Doug Smith and Jim Thomas, inside this edition of C2CTVDX.

Bob Seybold
1865 W. Main Rd.
Silver Creek, NY 14136

Nick,

It has not been a highlight season. There were a few openings which netted me a few new ones. CJCN-4 Grand Falls NF, CJOM-3 Argentia NF, CJCH-5 Nova Scotia, WKBN-41.2 Youngstown, WTAE-51, WPGH-43, WPXI-48, WJAC-34, and WWCP-8.

Another opening (early in September) covered Indian to east coast (700-mile path). Big opening (trops) to Kansas 1000 miles (all digital) in October. Several trop openings to Michigan, Ohio (WRLM-47, Akron, Canton, Toledo, Lima, etc.). The Kansas opening had: KDCU-31 Derby, KHDS-51 Salina.

Three highlights were visit from Frank Merrill, Mexicans on 2, 3, 4 + 5 (double-hop). July-12-14 heavy E-skip. June 15 had HRLS-2 San Pedro, Honduras. Still noting analogs on channels 2, 3, 4, 5, 6, 8 + 11 mostly low power Canadians. Best to all.

Jim Thomas
Springfield, MO

NOVEMBER 2016 REPORT

RF/VC CALLS CITY/STATE DISTANCE (Miles)
NEW ReLOG

11-03-16
12/12 KFVS-TV Cape Girardeau, MO 212.96 NEW

11-04-16
34/3 WSIL-TV Harrisburg IL 248.18 Relog
22/23 KBSI Cape Girardeau MO 209.71 Relog
20/19 KTEJ Jonesboro AR 172.33 Relog
32/6 WPSD-TV Paducah KY 241.74 Relog

48/48 KVTJ-DT Jonesboro AR 195.64 Relog
25/24 WATN-TV Memphis TN 242.84 Relog
41/40 WBUY-TV Holly Springs MS 242.84 Relog
13/6 KEMV Mountain View AR 116.86 Relog
33/34 KOCB Oklahoma City OK 256.92 Relog
29/36 KTUZ-TV Shawnee OK 256.43 Relog
40/43 KAUT-TV Oklahoma City OK 255.4 Relog
47/47 KWHB Tulsa OK 153.25 NEW
16/16 KAJL-LD Fayetteville AR 88.95 Relog
11/11 KOED-TV Tulsa OK 153.25 Relog
22/23 KOKI-TV Tulsa OK 153.17 Relog
27/27 KFTA-TV Fort Smith AR 115.05 Relog
45/6 KOTV-DT Tulsa OK 153.25 Relog
42/41 KMYT-TV Tulsa OK 153.17 Relog
17/17 KDOR-TV Bartlesville OK 141.61 Relog
20/19 KQCW-DT Muskogee OK 170.08 Relog
18/19 KCPT Kansas City MO 139.07 Relog

11-05-16
18/5 KFSM-TV Fort Smith AR 107.78 Relog

11-10-16
Surprise morning tropo opening that lasted about 1/2 hr. Was working to get TSReader files, but tropo duct didn't last very long. Also had most of the Little Rock AR dtv's in @ 177 miles.

16/19 WMAH-TV Biloxi MS 515.71 Relog
25/55 WFNA Gulf Shores AL 555.82 NEW
27/5 WKRG Mobile AL 553.7 miles Relog
34/34 WRBJ-TV Magee MS 416.05 NEW

Had some brief tropo come back up late in the evening, but didn't last long. Had signals on several channels, but only one decode.

KLTS 24 Shreveport LA 317.84 NEW

11-26-16
This time of year seems all the tropo now follows the High pressure systems as they sink into the deep south. That's what happened with this latest round. Nothing phenomenal but stations I haven't seen in awhile.

12/11 KTHV Little Rock AR 177 miles Relog
13/6 KEMV Mountain View AR 116 miles Relog
14/24 KNLC St. Louis MO 172 miles Relog
22/7 KATV Little Rock AR 177 miles Relog
22/23 KBSI Cape Girardeau MO 210 miles Relog
24/4 KMOV St. Louis MO 172 miles Relog
26/11 KPLR St. Louis MO 190 miles Relog
27/2 WKRN Nashville TN 372 miles Relog
29/10 WKNO Memphis TN 246 miles Relog
30/16 KLRT Little Rock AR 177 miles Relog
31/30 KDNL St. Louis MO 189 miles NEW
32/4 KARK Little Rock AR 177 miles Relog
32/6 WPSD Paducah KY 242 miles Relog
34/3 WSIL Harrisburg IL 248 miles Relog
35/5 KSDK St. Louis MO 189 miles Relog
43/2 KTVI St. Louis MO 186 miles NEW

Doug Smith (W9WI)
Pleasant View, TN
http://www.w9wi.com

More autoscanner DX from Pleasant View, Tennessee. Unfortunately, due to a power failure (and my stupidity) it wasn't running during the first part of a large opening...

27 Nov 2016 Tr

0256	KSDK	35	MO	St. Louis	232
1153	KDNL	31	MO	St. Louis	232
1203	WAND	17	IL	Decatur	261

12 Dec 2016 Tr

1936	KTVI	43	MO	St. Louis	232
2022	**WPCH**	20	GA	Atlanta	237

20 Dec 2016 Tr

1935	WAKA	42	AL	Selma	294
2110	WMAU	18	MS	Bude	405
2117	KLRT	30	AR	Little Rock	322
2237	WIIQ	19	AL	Demopolis	282

21 Dec 2016 Tr

0443	WLOV	16	MS	West Point	212
0453	WABG	32	MS	Greenville	286
0644	WIAT	30	AL	Birmingham	202
0709	WTTO	28	AL	Homewood	202
0919	KATV	22	AR	Little Rock	322

Stations in bold are new to the log.

Southern FM DX
John Zondlo – 4009 Driftwood Circle – Yukon, OK 73099
southernfmdx@wtfda.org – Deadline: 15th
January 2017

Fred Nordquist – Moncks Corner, SC – FM03af
Sangean HDT-1X, AirSpy with SDR Console, APS-13 antenna

8/30 Gw
2135 WMHE-lp 102.9 SC Charleston, religion, Catholic Radio 31

9/7 Tr
2227 WJIS 88.1 FL Bradenton, HD over local 445

9/8 Tr
0003 WNDT 92.5 FL Alachua, ID, "Wind FM," rock 279

9/11 Tr
0737 WLPE 91.7 GA Augusta, RDS PI: 7330, PS: WLPE-FM, religious talk 116

9/28 Gw
1800 WYLA-lp 97.5 SC Charleston, ID, variety of music 30

9/29 Tr
0834 WYRD 106.3 SC Simpsonville, ID, news 169
1125 WPZS 92.7 NC Indiana Trails, "The Block," hip hop 139

10/17 Gw
2207 WXMB-lp 101.5 SC Myrtle Beach, religion 70
2324 W272CV 102.3 SC Myrtle Beach, classical WHQR translator 71

10/17 Tr
2232 WKXS 94.5 NC Leland, "94.5 The Hawk" 134

10/18 Tr
0007 WAAE 91.9 NC New Bern, AFR, religion 214

10/19 Tr
0830 WZCO 89.9 NC Chadbourn, variety of music, multi-station ID 116

10/19 Gw
2231 W241BI 96.1 SC Orangeburg, BBN, religion 54

10/31 Gw
2100 W242CB 96.1 SC Florence, ESPN Radio, WSIM HD2 translator 68

10/31 Tr
2357 WBQO 93.7 GA St. Simons Island, RDS PI:58FA, PS: WBQO, ID 166

11/23 ES to south TX MUF: 102.3
2119 KYKZ 96.1 LA Lake Charles, local ads 812
2129 KHCJ 91.9 TX Jefferson, KHCB ID, religion 841

11/24 ES OK/AR/TX/LA MUF: 102.7

0948	KDOE	102.3	OK	Antlers, ID, “KDOE 102.3” 902
0950	KZAM	98.7	TX	Pleasant Valley, SS local ad for Wichita Falls 1075
0953	KTLS	106.5	OK	Holdenville, “Boss FM” 954
1006	KHRK	101.5	AR	Malvern, oldies, “Kool” 748
1018	KADA	99.3	OK	Ada, local ads 965
1022	KQUS	97.5	AR	Hot Springs, “US 97,” central AR weather 759
1030	KYKC	100.1	OK	Bing, SID 967
1112	KETX	92.3	TX	Livingston, local ads 892

12/2 Es TX/MX/LA MUF: 107.9

1831	KBUC	102.1	TX	Raymondville, PI: 14AE, PS: Super Tejano 102.1, SS 1160
1836	KYRK	106.5	TX	Taft, “106.5 The Shark” 1089
1841	KLHB	105.5	TX	Portland, ESPN sports talk 1101
1850	KRRG	98.1	TX	Laredo, “Buck Country 98.1” 1228
1851	KJOJ	103.3	TX	Freeport, SS, “La Raza” 973
1900	KFTX	97.5	TX	Kingsville, SID 1114

12/5 Gw

2012	W221CI	92.1	SC	Summerville, PI: FFFF – ‘WXB,’ PS: The City 92.1 & 102.1, // WMXT “The City” Charleston 16

All above are new loggings. Total to date = 3390. There were too many relogs to list for the Es openings.

Doug Smith – Pleasant View, TN

12/20 Tr

WJSP	88.1	GA	Warm Springs, HD PAD “WJSP-FM” 280
WMJJ	96.5	AL	Birmingham, “Magic 96,” “Rob and Hillary Blog” 204
WJQX	100.5	AL	Helena, “100.5 ESPN,” presumably not Monona 228
WZZK	104.7	AL	Birmingham, “104-7 WZZK” 202
WUAL	91.5	AL	Tuscaloosa, “WUAL” RDS 229
WKSJ	94.9	AL	Mobile, “Sand Dollar Lifestyle Store” in Mobile, “Christmas Night of Lights” at Hank Aaron Stadium 400
WLZA	96.1	MS	Eupora, “96-1 WLZA” 226
WZRRt	99.5	AL	Birmingham, political talk 207
WNTC?	103.9	KY	Drakesboro, legal ID for WPRT 102.5 49
WMEZ	94.1	FL	Pensacola, Delilah, only affiliate on 94.1 within reasonable range 402
WFFN	95.3	AL	Coaling, ABC 33/40 weather for Tuscaloosa 232

12/21 Tr

WZBQ	94.1	AL	Carrollton, glass recycling in Tuscaloosa 227
WUWF	88.1	FL	Pensacola, HD PAD “WUWF-FM” 414
WFTA	101.9	MS	Fulton, Tupelo request 168
WWON	100.7	TN	Waynesboro, Waynesboro and Clifton weather 83
WLAY	100.1	AL	Littleville, shoalskia.com 124
WTXT	98.1	AL	Fayette, “98-1 TXT” 216
WBHJ	95.7	AL	Midfield, “95-7 Jamz” with Ricky Smiley 203

WLAY-FM previously logged as WSHK 97.7 Russellville. There’s been two frequency changes (103.5, then 100.1) and at least one call change along with the city-of-license.

FCC's Stage 3 Forward Auction Closes After Single Round, Stage 4 to Start Next Week

Written by Diana Goovaerts for *WirelessWeek* [Dec 1, 2016]
Source: https://www.wirelessweek.com/news/2016/12/fccs-stage-3-forward-auction-closes-after-single-round-stage-4-start-next-week

Are we really surprised?

Stage 3 of the FCC's forward auction closed after a single round on Monday, propelling the proceedings toward an expected Stage 4 reverse auction start date next week.

According to the FCC's Incentive Auction Dashboard, Stage 3 forward auction proceeds totaled just $19.7 billion against a clearing cost of $40.3 billion. BTIG's Walter Piecyk noted the figure represented an 8.6 percent drop from the Stage 2 proceed total.

"The relatively quick completion of the third stage of the forward auction comes as no surprise given pre-auction indications from potential purchasers and the current state of the mobile industry in the United States," Dan Hays of PwC Strategy& Principal said. "Despite strong commitments to date from buyers in the forward auction, top-line proceeds may struggle to make it north of $20 billion as operators' capital spending priorities have seemingly shifted away from spectrum at this time."

The proceedings will now move on to a Stage 4 reverse auction, with an expected (but not yet confirmed) clearing target of 84 MHz, down from 108 MHz in Stage 3. Analysts, including Hays, said they expect the drop to come with a corresponding dip in the clearing cost. But while just how much of a dip there will be is anyone's guess, it won't be determined by broadcasters.

As explained earlier on Monday by FCC Incentive Auction Task Force Senior Advisor Charles Meisch, the clearing cost is determined by two "separate but related" factors: the number of station licenses the Commission needs to buy and the price the Commission needs to pay to purchase those stations. Each time the spectrum clearing target drops, Meisch explained, the Commission needs to buy fewer licenses because it gains more UHF channel space in the TV band in which to repack stations as they drop out of bidding. And the smaller the number of licenses the FCC is required to buy, the lower the Commission can drive prices paid to an individual reverse auction bidders.

More on how those two factors function can be found here. But the important thing to note is that twice as many UHF channels will become available between Stages 3 and 4 as were freed up between Stages 1 and 2, when there was a 37 percent drop in the clearing cost.

In his Monday afternoon note, Piecyk speculated this could result in a price drop that brings the clearing price down below $25 billion.

"We think it is therefore reasonable to expect the Stage 4 reverse auction bids to surpass the 37 percent drop experienced in Stage 2, resulting in less than $25 billion of provisional winning bids and an auction bogey of ~$26 billion or lower when factoring in clearing costs and fees," Piecyk wrote. "If the Stage 4 reverse auction bogey drops to $26 billion, it would be within reach of forward bidders to end the auction. Bids would simply have to rise $2.1 billion (11 percent) to trigger the extended round and $6.5 billion (33 percent) to end the auction. If that is still too high, it would be on to Stage 5, which we estimate could deliver a $20 billion auction bogey. In that scenario, the amount of spectrum sourced to wireless operators would only be 60 MHz, and the auction would still have a shot at a Q1 close."

The FCC said it is planning to release a public notice containing details about the Stage 4 proceedings on Friday, and said it expects bidding in the reverse auction to begin on Tuesday, Dec. 13.

Piecyk forecasted a Stage 4 forward auction could close by the end of January, with a potential Stage 5 forward auction wrapping up by mid-March.

The Map That Lets You Listen to the Radio Everywhere

Radio Garden is a meditation on connectedness and what broadcast technology does to local culture.

Written by Adrienne LaFrance for *The Atlantic* [Dec12, 2016]
Source: https://www.theatlantic.com/technology/archive/2016/12/the-map-that-lets-you-listen-to-the-radio-everywhere/510368/

The idea for the Golden Record was always as absurd as it was romantic—which is to say, utterly *human*.

Isn't it just like our species to conceive of such a project? To decide to record a strange and wonderful mixtape of eclectic songs and sounds, strap the album to a spacecraft, then send the whole apparatus billions of miles into the cosmos where it might soar through the vacuum of space for eternity? The alternative to an endless flight into the depths of space, of course, is that the Golden Record might actually be found in the unknown light of another world—on some distant planet, by some other species that could hear the record and begin to know humanity as a result.

Radio Garden, which launched today, is a similar concept—a way to know humanity through its sounds, through its music. It's an interactive map that lets you tune into any one of thousands of radio stations all over the world in real time. Exploring the site is both immersive and a bit disorienting—it offers the sense of lurking near Earth as an outsider. In an instant, you can click to any dot on the map and hear what's playing on the radio there, from Miami to Lahore to Berlin to Sulaymaniyah and beyond.

The project, created for the Netherlands Institute for Sound and Vision by the interactive design firms Studio Puckey and Moniker, was built using an open-source WebGL globe that draws from thousands of radio stations—terrestrial and online-only streams—overlaid with Bing satellite imagery.

A screenshot of Radio Garden, tuned into a station in San Francisco

The result is the best kind of internet rabbit hole: Engrossing, perspective shifting, provocative, and delightful.

The Golden Record is now more than 12 billion miles away from Earth, somewhere in interstellar space. Here on Earth, Radio Garden allows you to travel not just through space, but through time—or at least time zones. So when it's 5:08 a.m. in Nome, Alaska, and the local radio station is playing "Mercy Came Running,"—a song by the Christian trio Phillips, Craig and Dean—it's also 5:08 p.m. in Moscow, where Haddaway's 1993 hit "What Is Love" is on the radio.

At the same time—as in literally *at the same time*—you might find Bruno Mars's "Grenade" playing in Rome, where it's 3:08 p.m., and Billy Idol's "Dancing With Myself" playing in Honolulu, where it's 4:08 a.m, and The Talking Heads's "Wild Wild Life" playing in Buenos Aires , where it's 11:08 a.m. (That's in addition to all the songs in languages other than English playing everywhere from Ghana to Egypt to Mexico.)

Looking at (and listening to) the planet this way can leave you feeling paradoxically detached while still connected—like an omniscient observer finding familiar sounds in unfamiliar places. For one thing, radio as a medium often has a similar sound. That's not just because American pop music in particular is a global export, but because of similarities in how radio is produced around the world. Local stations, wherever they are, often broadcast a mix of music, ads, traffic, and weather reports—

and deep-voiced announcers adopt a similar tone across cultures. The aesthetic of the Radio Garden site—which uses satellite imagery rather than maps with political borders—helps further promote this feeling of connectedness. That was deliberate: Jonathan Puckey, who runs the interactive design firm Studio Puckey, told me that he and his colleagues wanted to leave people with the sense that "radio knows no borders." (Besides, he points out, click around enough and you'll find you can "tune into an Ethiopian spoken station in the middle of Kansas and an American station in the middle of South Korea.")

There are some limitations to how Radio Garden represents radio stations on our planet, however. The site depicts far more stations in the United States and Europe than in Africa and Asia, an imbalance that's partly technical and partly cultural. "In certain parts of the world it might be representative of the accessibility of the broadband internet connections needed to host these streams," Puckey told me. "We noticed that especially in Asia, many radio streams are using proprietary streaming codecs which are sadly not supported by web browsers." But also the team that made Radio Garden is based in Europe and consists of mainly English speakers, which made it harder for the site's designers to find and curate non-English streams. "We would love nothing more than to grow our collection in the parts of the world that are now missing," he said.

Yet Radio Garden still has a way of enhancing one's perspective of the planet, making it seem simultaneously big and small. "The internet sometimes gives me the feeling that physical locations no longer matter," Puckey told me. "But as I tune into these stations and zoom into the towns they are broadcasting from, it heartens me to know that there are all these local radio stations broadcasting about things that are of local importance."

Which is why, hearing the sounds of another place at the same moment in time doesn't just satisfy idle curiosity. It ends up being a new way of seeing the people of Earth—a view of humanity in the abstract, and also at the individual level.

Perusing Radio Garden, you begin to imagine the people listening to music as they make coffee, the people sitting in offices and in waiting rooms, the people dancing at the bar after last call, the people cooking dinner for their families, and the people driving to work before dawn. Some of these people look like you. Some do not. Some of them know different truths and have different values. Some live in the lands of your ancestors, but speak languages you cannot understand. Though you may never meet these people, you can begin to know them this way—by listening to what they hear.

"We don't know whether human music will mean anything to nonhuman intelligences on other planets," wrote Timothy Ferris, who helped produce the Golden Record in the 1970s, in *Murmurs of Earth*, a collection of essays about how the record was made.

But that was okay. They could listen to what we hear, and begin to know us that way. And just as important as the music, Ferris argued, was the gesture: Launching the record into space, he said, was the act that would reveal who we are. "The record says: However primitive we seem, however crude this spacecraft, we knew enough to envision ourselves citizens of the cosmos," he wrote. "It says: However small we were, something in us was large enough to want to reach out to discoverers unknown, in times when we shall have perished or changed beyond recognition. It says: Whoever and whatever you are, we too once lived in this house of stars, and we thought of you."

If the Golden Record is a way to convey to intelligent life elsewhere that we share with them a house of stars, then Radio Garden says this to our own species: Whoever and whatever you are, we too live on this spinning planet, and we are thinking of you.

November 2016

The Iconoscope TV Camera at W6BM, Berkeley

John Staples, W6BM

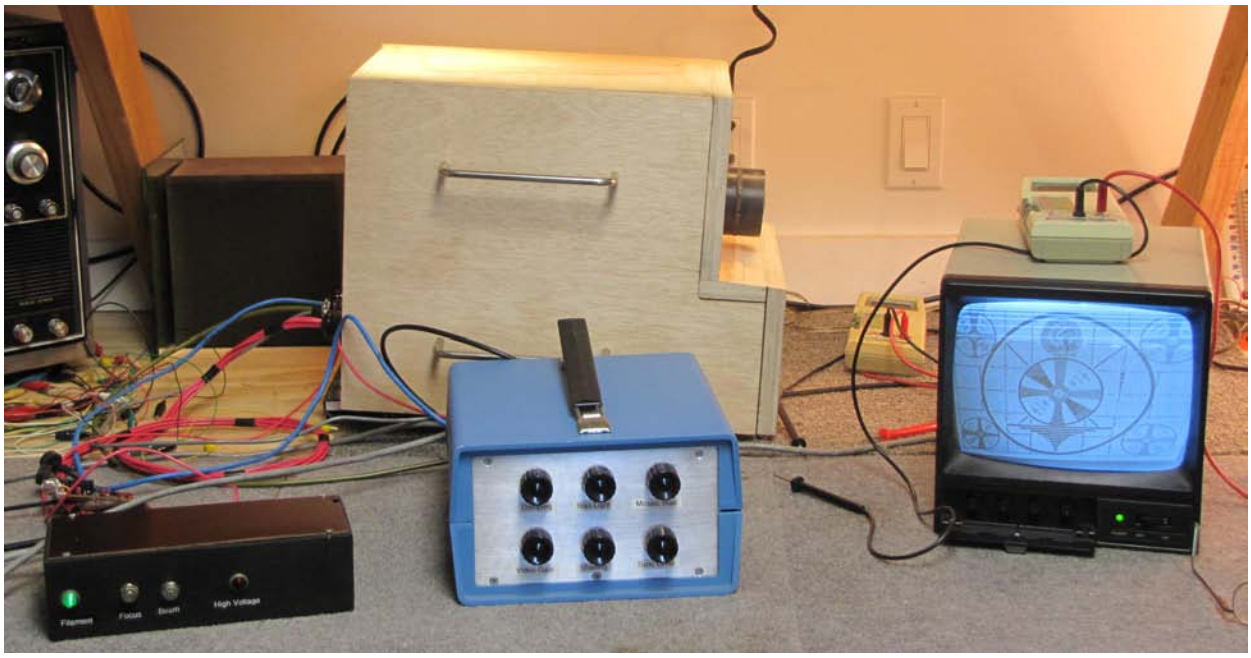
1. Background

The mechanical television era, dating from the early 1920's, used mechanical scanning technologies (discs, lenses and mirrors) to rasterize the subject with resolution from 30 lines, 12.5 frames per second, ultimately to 240 lines, 50 progressive frames per second by the middle '30's. The scanning can proceed from left-to-right, or from top-to-down, as in the original Baird system. Each scan line comprises 30 to hundreds of pixels, which defines the resolution in the direction of the scan line.

As each pixel element in the scene is scanned by one-by-one, the time exposure of each element is only the short time the scanner dwells on that pixel, requiring a high scene illumination.

If all the pixel elements of the scene can be stored in parallel, say on a 2-dimensional array of capacitors, and then each read out sequentially, the sensitivity is significantly increased. This is the basis of the iconoscope image pickup tube which stores the image on a mosaic plate of millions of individual small photosensitive capacitors which charge up individually according to the brightness distribution of the screen.

I acquired an RCA 1850A iconoscope 20 years ago from Al Jones, the founding president of the Tube Collectors Association. It was time to put this valuable tube to work in a camera, joining three known operational iconoscope ("ike") cameras in the world. Below I report on my decisions and technical progress in this successful endeavor.



2. Construction

My goal was to produce a working camera with construction techniques that I could easily master. The camera body is fabricated of 3/4” plywood, easier for me to work with than an all-metal box which would also have easily provided the required RF shielding.

Should I use more authentic (for the '30's) vacuum-tube electronics, or go solid-state? Solid-state won out, particularly for the video circuits, as wide-band amplification is much easier to accomplish with wide-band op-amps. Also, except for the iconoscope high-voltage circuits, all DC voltages are safely less than 12 volts.

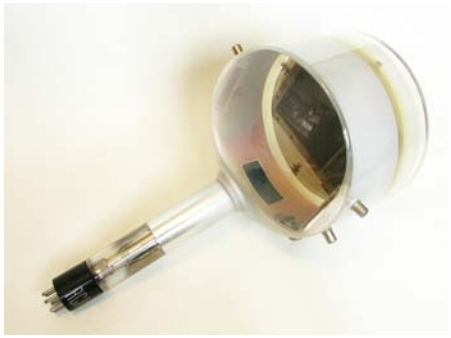
The individual circuit modules (video, deflection, power) would be constructed separately so they could be debugged easily. Most of the electronics was constructed on a protoboard, as many circuit variations were tried until a successful one was found. Then, the circuits were rebuilt on 0.1 inch perf boards and packaged in small enclosures with connectors for the cables.

As many of the components as possible would come from my extensive junkbox, some of them unlabeled transistors and FETs, which were characterized on a curve tracer, so the circuit diagram does not contain type numbers for some of the components.

Should the sync be full NTSC, or just random interlace for a 525-line picture? The current choice is random interlace scanning, so the video image cannot be captured on a video recorder. I have three NTSC sync generators, and it would be not too difficult to substitute them for the present sync generators, but it would add to the bulk of the system and hamper the portability of the equipment. That may come later.

The lens is probably from an old photocopy machine and is well-suited to the camera. It is a 2 inch, f/4 flat-field lens with an 8.5 inch focal length, with no adjustable iris. A fast lens is required, as the sensitivity of the camera is still low compared to modern cameras, and the scene requires a high level of illumination. Sunny outdoor scenes are fine, but indoor incandescent-lit scenes require a lot of light.

3. Iconoscope Tube



To increase the sensitivity of image pickup devices, the storage principle was invented. V. K. Zworykin, who first studied TV technology in his native Russia, then in the USA, mostly at RCA, developed the iconoscope tube in the late '20's as a high-sensitivity (at that time) storage-principle image tube for high-definition (at that time) television.

A lens focuses the scene on the mosaic, about the size of an index card, which consists of millions of small separate silver globules on an insulating mica substrate. The globules are treated with cesium, which renders them photosensitive, so they will emit photoelectrons when hit by light and thereby charge up. Behind the mica substrate is a full-size signal plate, connected to the video amplifier.

An electron beam scans across the mosaic, and recharges each small globule that has lost electrons, causing a signal to be capacitively coupled to the signal plate, generating the small video signal.

The actual operation is much more complex than this, which reduces the sensitivity of the iconoscope to 5% of its theoretical value, but the gain in sensitivity is enough to make the tube practical for the advent of fully electronic television.

Experimental television broadcasts in the US used iconoscope tubes up to the war, and were replaced by the superior orthicon tubes after, with the iconoscope still used in the late '40's for film pick-up.

Another tube, the image dissector, was invented in the '30's by Farnsworth, which was a non-storage tube, but with the addition of a secondary-emission signal amplifier, could produce good quality pictures, but still lacked the sensitivity to make live electronic television practical with it.

4. Design

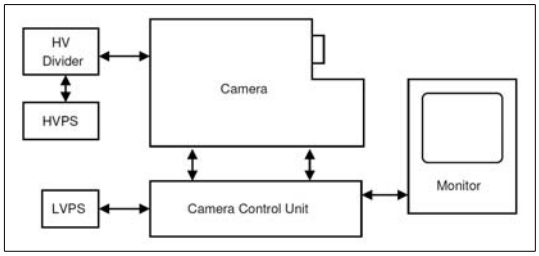
Due to the small magnitude of the video signal, the iconoscope must be fully shielded from outside interference. Broadcast stations in the 1 MHz band would produce strong interference in the image signal.

The camera body is wood, which is fully lined on the interior with a copper screen Faraday shield. All connections to the camera pass through connectors fitted with RF bypass capacitors.

Only the video preamplifier is inside the camera body. It amplifies video the signal, which is less than 0.1 microampere, at high impedance to a level that can be safely transferred on coax to the video amplifier chain. Also inside the camera housing are the deflection yoke, the high-voltage leads to the iconoscope, and the bias lights, which are used to put a uniform illumination on the mosaic which has an effect on the sensitivity and spurious signals (shading) of the iconoscope.

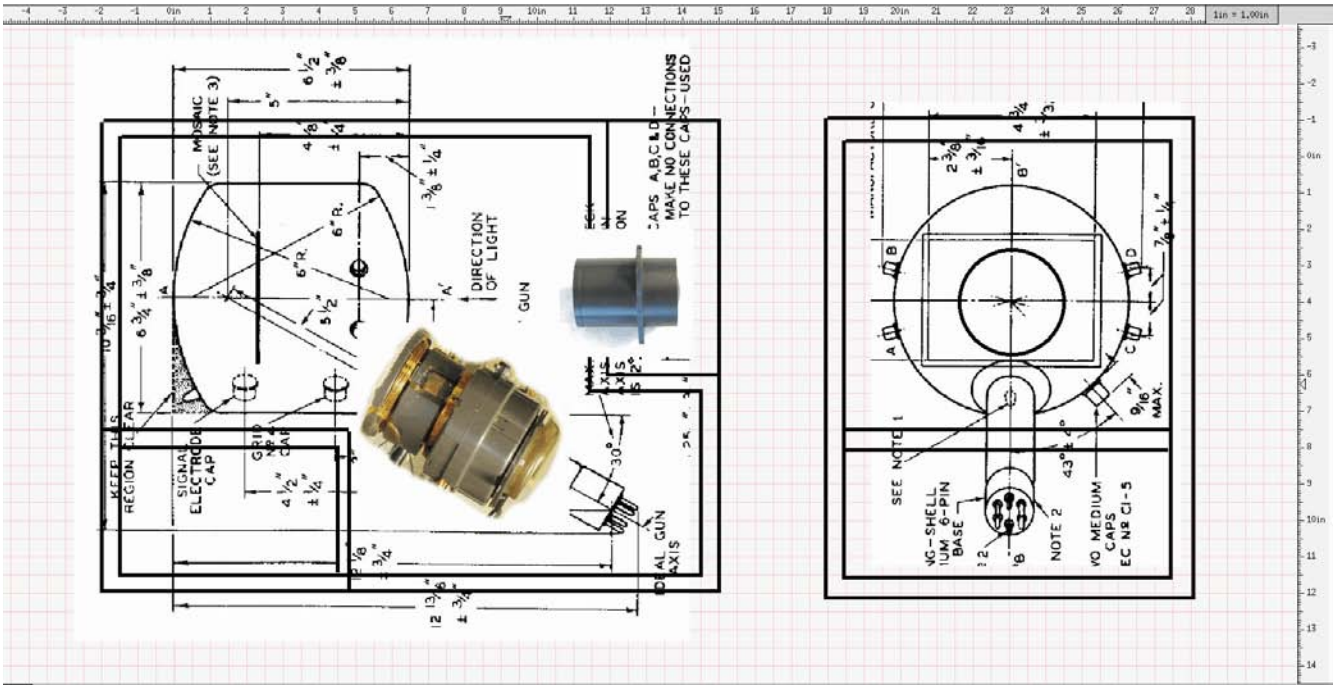
The iconoscope tube itself is wrapped with an aluminum foil shield to further prevent electrical interference from the deflection yoke from entering the tube. Shielding turned out to be the most difficult issue to solve satisfactorily, as the overall video gain is so high, the signal is so weak, and the bandwidth so large.

The circuitry external to the camera body is broken up into individual modules: camera body itself with video preamp, the video amplifier, the deflection circuits, the 1-kV HV divider chain for the iconoscope tube, and the LV and HV power supplies, along with the monitor. All modules are connected with cables and connectors.



5. Camera Body

The camera case is built of ¾ inch plywood, cut from a 2 by 4 foot piece. The camera case pieces are joined by internal bracing, so no screws are visible from outside. The figure shows the outline of the wooden case around the iconoscope, the lens and the deflection yoke, viewed from the side and from the front. The iconoscope sits on a “boat” that secures it with nylon straps to a form-fitting cradle. The cradle sits on a shelf and is attached with long bolts with wing-nuts to allow a coarse positioning of the iconoscope.

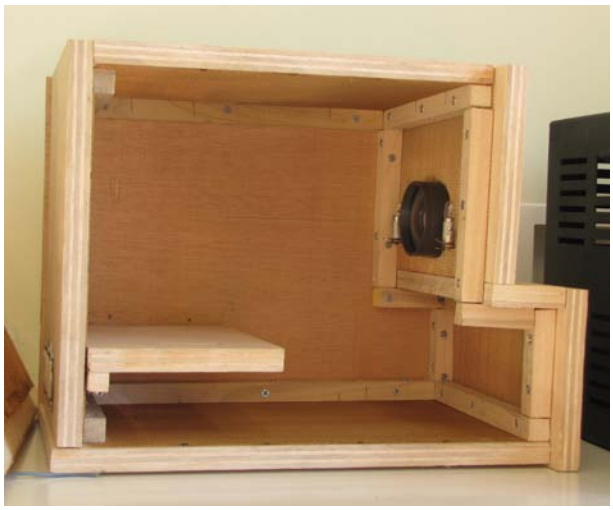


The entire case is Faraday-shielded with a copper screen completely lining the case, except for the lens opening. All the sections of the screen are connected together, and contact is made to the screen on the removable side through four banana-plug mounting points.

The internal wiring for the deflection yoke and the high-voltage to the iconoscope are shielded in braid to prevent radio interference inside the case.

Two DC-operated lamps form the bias light that can flood the mosaic with a uniform low-level light, which has a small effect on the shading signal generated by the iconoscope.

Connections to the outside of the case are through three ceramic octal sockets, where all the non-signal conductors are bypassed to ground by capacitors.



6. Lens

The lens is a f/4 flat-field lens with a 8.5 inch focal length. There is no adjustable iris. The lens probably came from an office copier.

The lens has a tight slip-fit to the hole in front of the case and is directly in line with the center of the mosaic. Focus is adjusted by manually moving the lens in the hole of the case. The range of focus is from about 3 feet to infinity.

7. Iconoscope Circuits

The iconoscope voltages include 6.3 volt AC for the heater, and a 1 kV accelerating voltage between the cathode and the mosaic. The electrostatic focus electrode requires approximately 400 volts, and the control grid (beam electrode) operates up to 100 volts negative to the cathode.

The iconoscope is operated with the mosaic at about ground potential within a few volts, so the heater is near 1 kV negative, requiring a filament transformer with good insulation. The resistive divider is located in a separate box, with the HV introduced through a HV-connector (similar to a BNC). A resistor string drains 2 mA and contains two potentiometers for focus and beam current, on HV standoffs for safety, and indicator lamps for filament (incandescent) and HV (neon) with green and red jewels.

The case has a cover (not shown here) to prevent access to the high potential.

The high voltage is provided by a regulated 0-2 kV Power Designs 2K-10 power supply, that is controllable down to an increment of one volt. The supply is current-limited to 10 mA.

8. Video Preamplifier

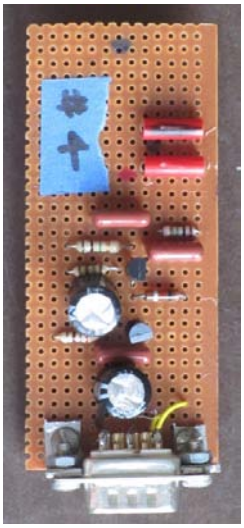
The video preamplifier is the most critical circuit element. The iconoscope video output current is a fraction of a microampere, and must be amplified to the volt level with a bandwidth of several megaHertz.

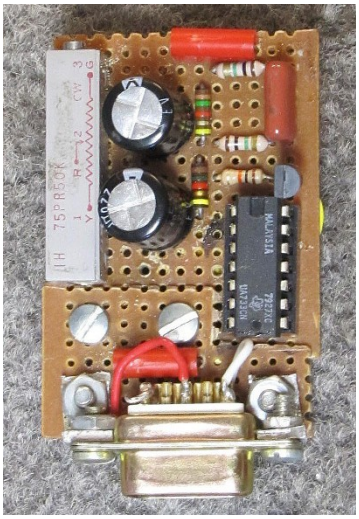
The choice of the input resistor to the preamp is critical. As the iconoscope is a current source, the voltage developed across the resistor is proportional to the value of the resistor, so a high value will generate a larger voltage into the preamp. However, the distributed capacitance of the mosaic, the wiring, and the input capacitance of the first amplifier stage will form a low-pass filter.

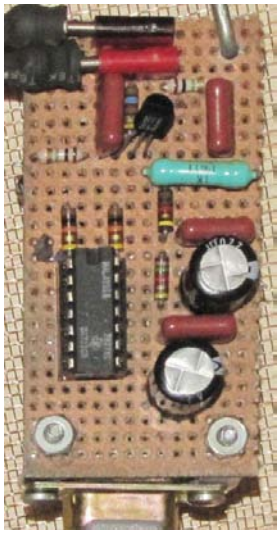
The capacitance is typically 15 pF, so for a total input resistance of 0.5 MegOhm, the corner frequency is around 20 kHz, at which point the frequency response falls at 6 dB per octave above that, or around 40 dB at 4 MHz.

The input resistor also generates a thermal noise (Johnson noise). The voltage is proportional to the square-root of the resistance value, so the signal-to-noise ratio favors a larger resistor value, but the bandwidth favors a lower input resistor. The decision also includes the noise figure of the preamplifier itself, and with a low-noise FET input stage, the value of the input resistor has been chosen to be 0.5 Meg. This resistor is actually two 1 Meg resistors in parallel: one for the input gate of the FET, and the other one in the circuit that allows the bias of the mosaic to be changed to be a few volts of either polarity with respect to the collector ring, which is the ground reference for the iconoscope.

Much of the development effort of the camera is finding a suitable preamp circuit. The preamp is the only active circuit inside the camera body, which was swapped out frequently. To make development easier, several candidate preamps were built on a small perf board with a DB-9 power and signal connector, and mini-pin jacks for the mosaic and collector terminations to experimentally determine the best circuit.

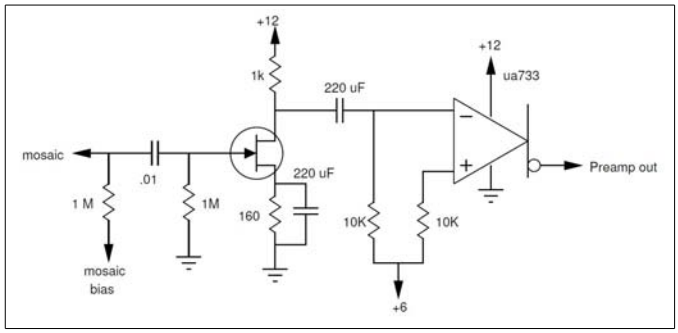






The preamp configuration chosen for now uses an NTE-312 depletion-mode NPN J-FET in common source configuration with a 1K drain resistor. This FET is a VHF amplifier with a 10 dB power gain at 400 MHz with a 2 dB noise figure at 100 MHz. Even with high-peaking in the video amplifier circuit, the amplifier noise level is acceptably low.

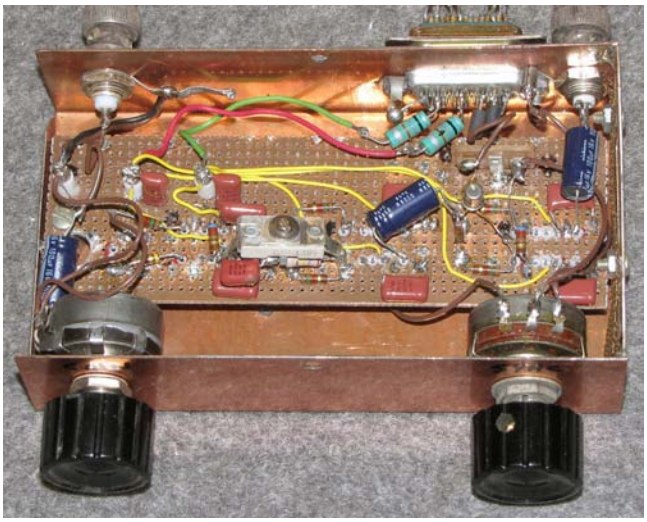
The FET is followed by a ua733 op-amp, which has a frequency response to 200-400 MHz, depending on the gain setting and about a 12 microvolt rms noise level at the input. The input impedance is larger than the 1K FET drain resistor, and it can drive a few hundred ohm load.



The op-amp has both inverting and non-inverting inputs, and inverting and non-inverting outputs, which is very useful in determining the proper polarity of the video. The voltage from the iconoscope mosaic is positive-going for black, and the video polarity out of the video chain provides a negative-going black signal.

9. Video Chain

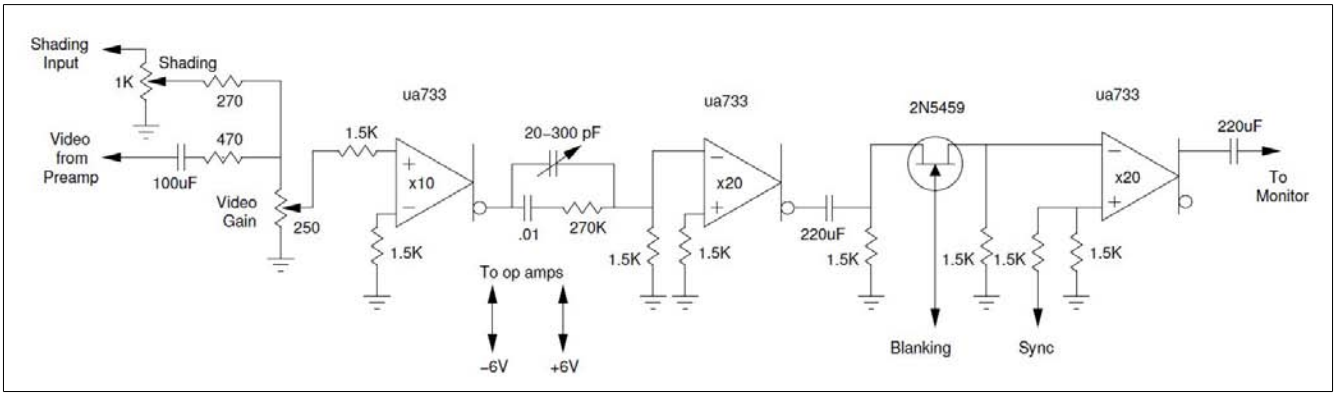
The video chain provides most of the wide-band video amplification, sync , blanking and shading insertion, video frequency response peaking and gain control.



The gain element is the ua733 wide-band op-amp, which provides a flat 200 MHz passband down to DC. Three stages of gain are used, so taming the gain block, along with the design of the preamp, is a most challenging task.

The video amplifier is built on a copper substrate perf board, with all power supply leads bypassed and run through chokes and ferrite beads, with the bypass capacitors soldered directly to the copper substrate.

The amplifier is housed in its own copper-plated box to shield it from outside RF interference. The two knobs are the video gain and sync level. Later, an additional shading level control was added.



The voltage gain per stage is adjusted with external gain adjust resistors to be between 10 and 20.

The video from the preamp and the shading generator are mixed together and regulated through the video gain control. At the exit of the first stage the frequency roll-off due to the distributed capacitance at the input of the video amplifier is compensated, with the low-frequency gain below 10 kHz attenuated some 45 dB.

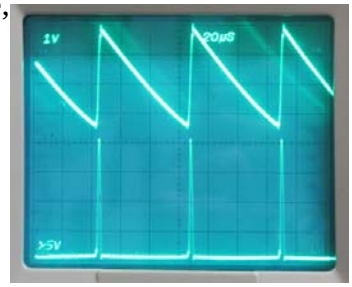
The video signal is amplified by 26 db in the second stage and applied to the blanking gate, a FET that is used as a series switch. The video is further amplified by another 26 dB in the output stage, with the synchronism waveform mixed into the non-inverting input of the output amplifier.

To use a standard video monitor, the video black polarity, as well as the sync tip, is a negative-going signal. The use of the inverting or non-inverting inputs of the op-amps allows the correct polarity of all the signals to be conveniently chosen at each point along the chain. The three amplifiers are powered between the +6V and -6V rails with a lot of bypassing. The amplifiers themselves do not require stability compensation, but good circuit layout is necessary for overall stability without VHF parasitic oscillation.

10. Deflection Yoke

The deflection yoke is of unknown origin and includes a separate set of centering coils that are not presently used. Since it is an unknown, the properties had to be determined. First, the DC resistance and inductance were measured. To determine the magnetization, a small precision-wound search coil was made and each set of deflection coils activated with a known AC current of 500 or 1000 Hz. The field along the axis at many points was measured with the search coil, and the integral magnetization calculated.

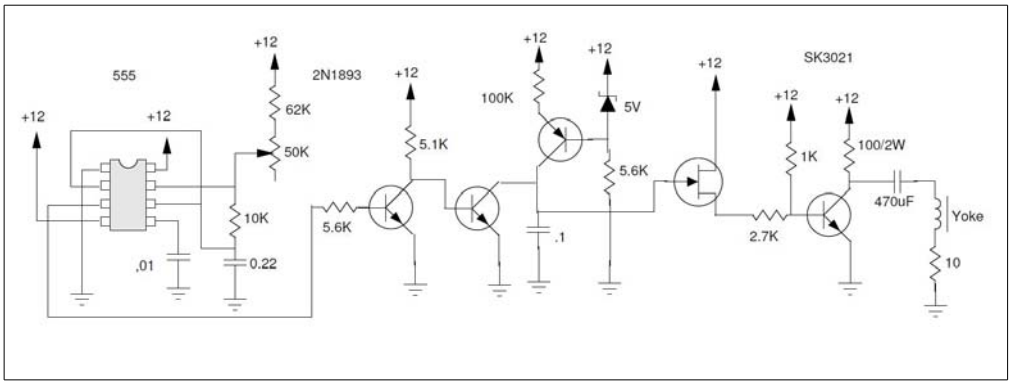
Knowing the rigidity of a 1 kV electron beam and the deflection angle of ±0.3 radians, the peak current through the coil could be calculated, which is 100-200 mA, depending on the direction of deflection. A circuit simulation determined the voltage waveforms required, which amounted to a 500 volt pulse for the horizontal deflection coil. The vertical coil required a combination of pulse and sawtooth waveform of about 2 volts. Each current waveform is monitored by a 10 ohm resistor in the return lead of each yoke, and the horizontal current waveform was used for the horizontal shading signal.



The horizontal current (top) and voltage are shown on the left, and the vertical on the right.

The deflection coil had to be completely shielded with grounded copper screen to reduce interference with the video signal.

11. Vertical Deflection System



The vertical deflection system is straightforward: a 555 timer generates a 60 Hz pulse waveform with a 10% duty factor.

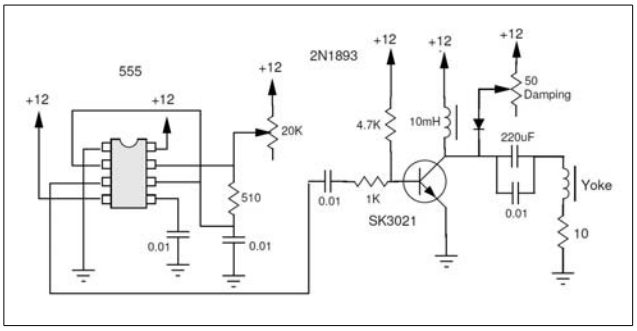
The following inverter applies a positive reset pulse to the discharge NPN transistor. A PNP current source supplies the constant current, producing a linear ramp on the 0.1 uF capacitor that is amplified by the FET-NPN Darlington that drives the horizontal yoke through a DC blocking capacitor. The output transistor is a SK3021 that can take a several hundred volt pulse on the collector, which is set on a heat sink. The only control is the 50K 10-turn screwdriver pot that sets the frequency.

12. Horizontal Deflection System

The horizontal deflection looks simpler, but it is not.

A 555 timer generates a 15750 Hz pulse with a 10% duty factor and applies it directly to the base of the SK3021 output transistor. The transistor is biased on during the cycle, so the magnetic field in the inductor in the collector lead stores magnetic energy.

The transistor is suddenly cut off at the end of the line of sweep, producing a several hundred positive-going voltage pulse that is conducted to the horizontal deflection yoke through the DC block. The yoke presents an inductive load to the driver, so the current waveform is a linear sawtooth.



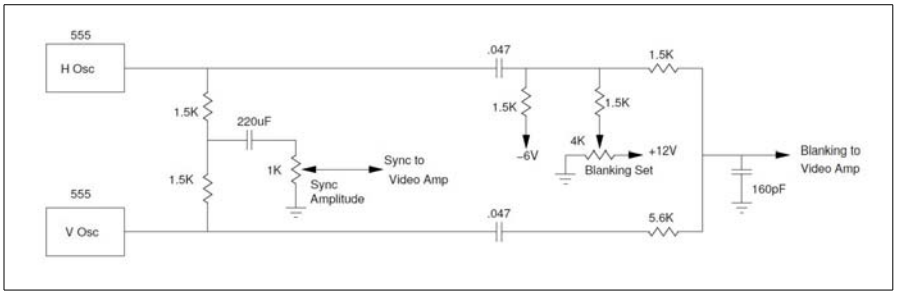
The diode and pot in the collector lead controls the overshoot (damping) of the flyback pulse.

The horizontal linearity is not yet completely satisfactory, and will be worked on in the future. The horizontal sawtooth waveform taken from the 10 ohm resistor in the yoke return leg is used to provide a horizontal shading signal that is fed back to the video amplifier.

13. Synchronism and Blanking Insertion

Both sync and blanking waveforms are required and are derived directly from the pulse waveform from each of the 555 timers.

To generate the sync signal, the two signals are simply added and fed to the video amplifier output stage and the amplitude is controlled by the 1K pot.



The blanking signal is fed to the FET series switch right before the video output stage. The blanking removes a large interference pulse in the video signal during retrace that results from radiation from the deflection yoke, even through the yoke has been Faraday shielded. The 4K pot sets the DC level of the blanking pulse so that full video comes through outside the blanking period, and no video comes through during blanking. No pedestal is seen on the video signal as a result of the very simple switch configuration.

14. Power Supplies

The LV and HV power supplies are commercial units. The LV power supply is an open-frame unit supplying+12V and -6V. A one-chip TO-3 6 volt regulator supplies the +6V from the +12V supply.

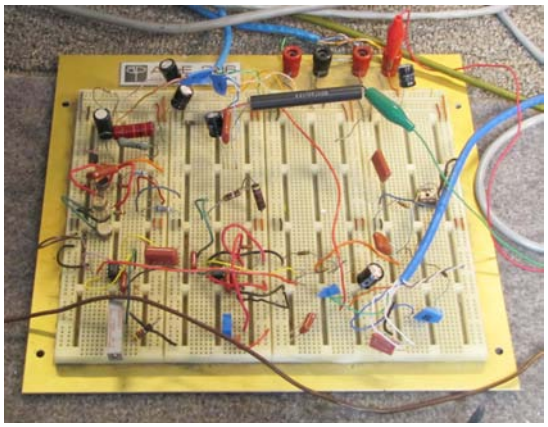
The HV power supply is a regulated commercial supply that sets the output voltage with decade voltage controls with a resolution of 1 volt.

The power is supplied to the modules through various connectors, such as HV coaxial connectors, or DB-9 connector to the camera control unit.

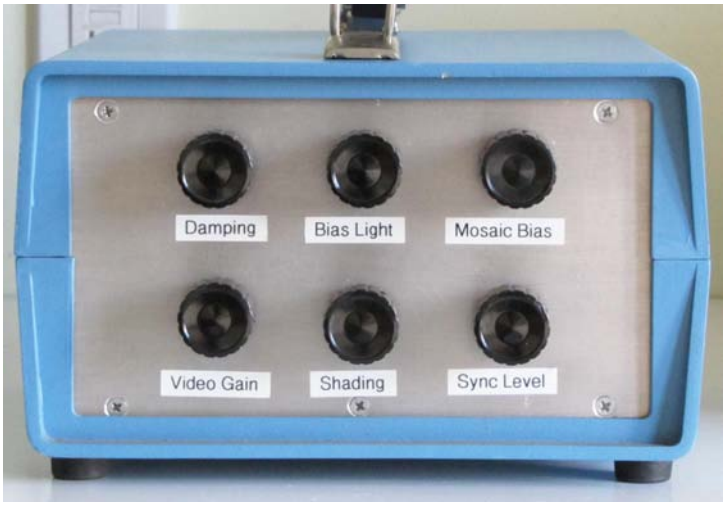
Three octal connectors are provided on the rear of the camera providing connections to the yoke from the CCU and power and signal to the CCU. A third connector provides the high voltages from the HV divider module.

15. Packaging

The deflection and video chain are collected together in the CCU, the Camera Control Unit. During development, the deflection circuits were created on a protoboard.



After a satisfactory design was achieved, the circuits were transferred to a perf board and placed in a cabinet with connectors to the power supplies, to the camera body and to the monitor.

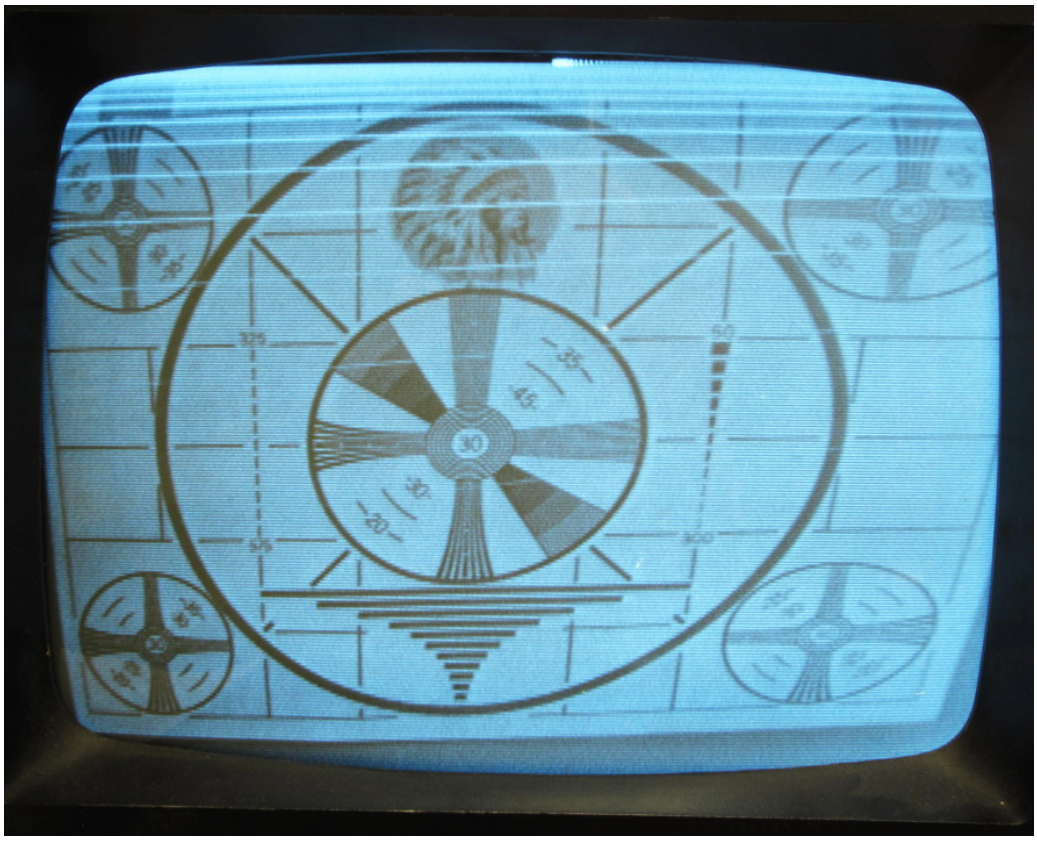


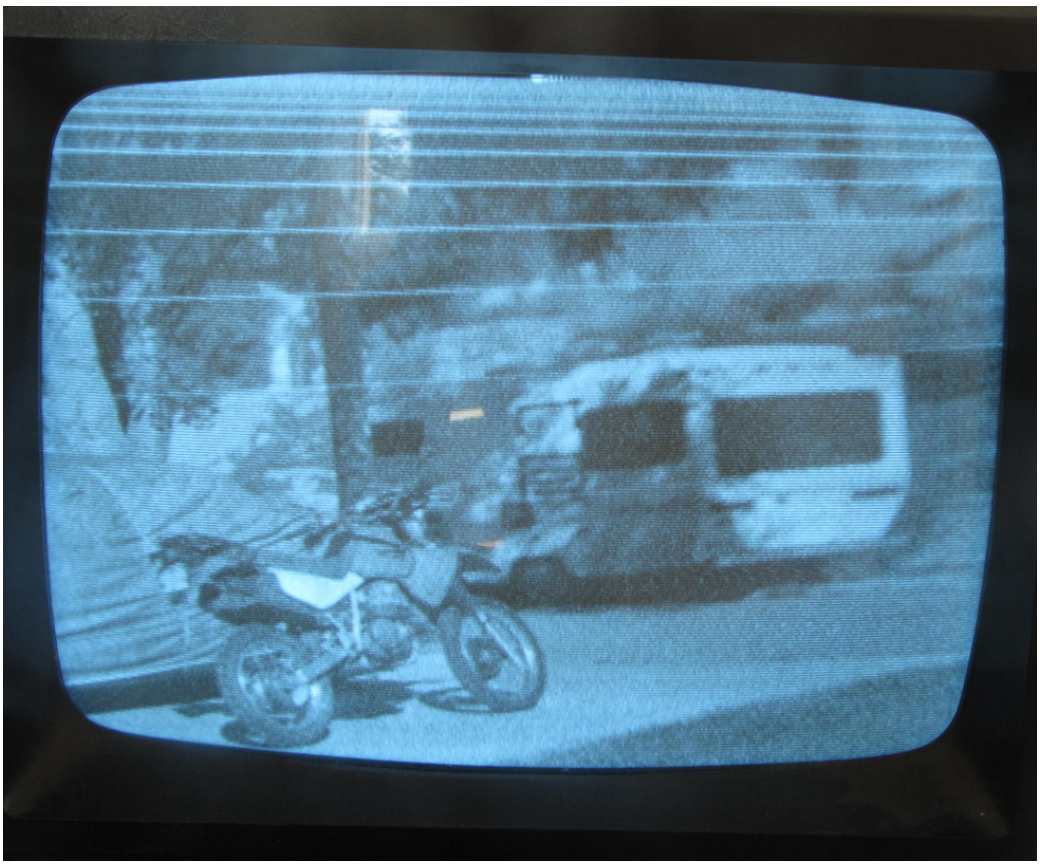
16. Performance

The performance seems to be equal to contemporary descriptions given in the 1930's report as far as image quality and lighting requirements. The 1850A iconoscope appears to be fully operational.

Lighting requirements cited in contemporary accounts indicated that an illumination of 3000 foot-candles was required, typical of outdoor sunlight on a typical spring or fall day. The iconoscope is mainly blue-sensitive, so for indoor lighting with incandescent bulbs, which are blue-poor, a lot of light was required, which was difficult for live talent.

The ultimate resolution of the iconoscope is several hundred lines. With the Indian head test pattern, the resolution seems to be near to commercial quality. Some noise is visible in the picture, which agrees with contemporary accounts of signal-to-noise figures of perhaps 30 dB or so.





17. Future Development, Lessons Learned

That it works at all is a miracle. The video amplifier chain seems to work well, although during development, some instability issues stemming from the high-gain, wide-bandwidth amplifier chain produced some oscillations in the 50-200 MHz range, which were difficult to diagnose until a wide-band spectrum analyzer was used to find the oscillation.

Complete shielding of the iconoscope and all following amplifiers is essential. RF interference from the broadcast band, as well as lamp ballasts easily sneaks in anywhere. The camera body was designed from the outset to be a Faraday cage, but additional shielding of components inside the camera body was needed.

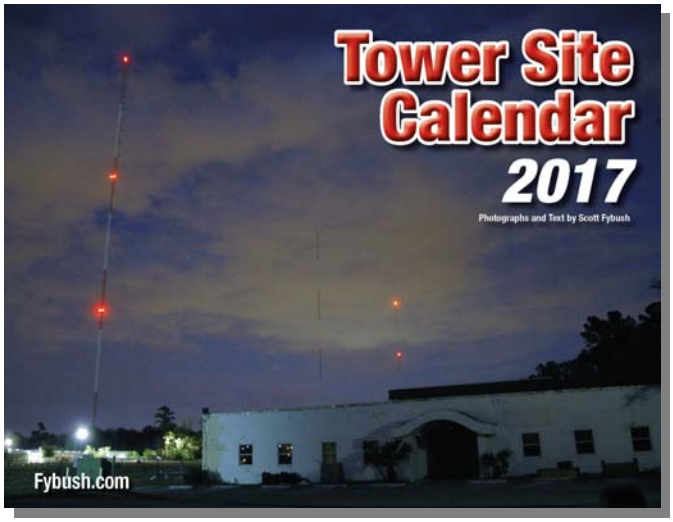
The deflection circuits are less satisfactory, as the linearity is not ideal, and vertical retrace lines are apparent. These have proven to be difficult to correct so far.

18. The Author

Dr. John Staples, W6BM, designs and builds particle accelerators at the Lawrence Berkeley National Laboratory. He received his Extra Class ham license and First Class Radiotelephone and Radar licenses in 1958. Besides being an avid collector of vintage electronics, he has been a passionate motorcyclist for over 50 years.

All pictures were taken by the author. Distribute this note freely.

THEY'RE BEAUTIFUL. THEY'RE TOWERS. THEY'RE IN OUR CALENDAR.



Open the pages of the 2017 *Tower Site Calendar* and you'll see art-deco buildings at twilight, lush fields of corn, cloudscapes to dazzle the imagination, and beautiful skies in myriad shades of blue.

And the towers. TV, FM, AM directional and nondirectional and a beautiful Blaw-Knox.

These photos are the reason people buy Scott Fybush's *Tower Site Calendar* year after year after year.

"Engineers are notoriously underappreciated for the hard work they do," says Fybush, who has worked in radio and television news for more than two decades. "The calendar shows some recognition for their design and maintenance of the infrastructure that allows all of us to have easy access to radio, TV and cellphones."

The 2017 edition, soon shipping from the Fybush Media store (fybush.com/shop) features thematic page designs, durable coil binding and pictures taken from Fybush's travels all over North America and beyond. This year's towers:

- **WBOB.** The Jacksonville, Florida station signed on during World War II.
- **WWVA.** A site dating back to the 1940s, still standing even after a recent severe storm.
- **WFEA in Manchester, New Hampshire.** America's oldest vertical AM tower.
- **A tower farm in Hales Corners, Wisconsin.** The site broadcasts radio to Milwaukee.
- **The site of the former CKSL.** The second station to sign on in London, Ontario.
- **The Voice of America's Edward R. Murrow transmitting plant in Greenville, North Carolina.** The only survivor of three VOA plants.
- **Two tower farms in the New Jersey Meadowlands.** The towers broadcast New Jersey and New York City radio signals.
- **Ann Arbor's 107one.** A rooftop site overlooking the University of Michigan campus.
- **KFXX in Portland, Oregon.** A three-tower array that diplexes with its Vancouver sister station.
- **KELO in Sioux Falls, South Dakota.** Celebrating its 80th anniversary in October 2017.
- **WBEE in Rochester, New York.** The station playing country music for 30 years.
- **KKAP, Aptos-Capitola.** A site camouflaged as flagpoles in the middle of a golf course.
- **KCTV in Kansas City.** A self-supporting tower more than 1,000 feet high, now a local landmark.

In addition to the photos, the calendar's monthly pages include significant dates in radio and television history, as well as civil and religious holidays.

The 2017 calendars cost $19.50 each ($21.10 including sales tax for New York State residents) plus $3.50 shipping first class or $6.50 Priority Mail, and can be purchased by check (payable to "Fybush Media") or money order to 92 Bonnie Brae Avenue, Rochester NY 14618, or online at www.fybush.com.

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