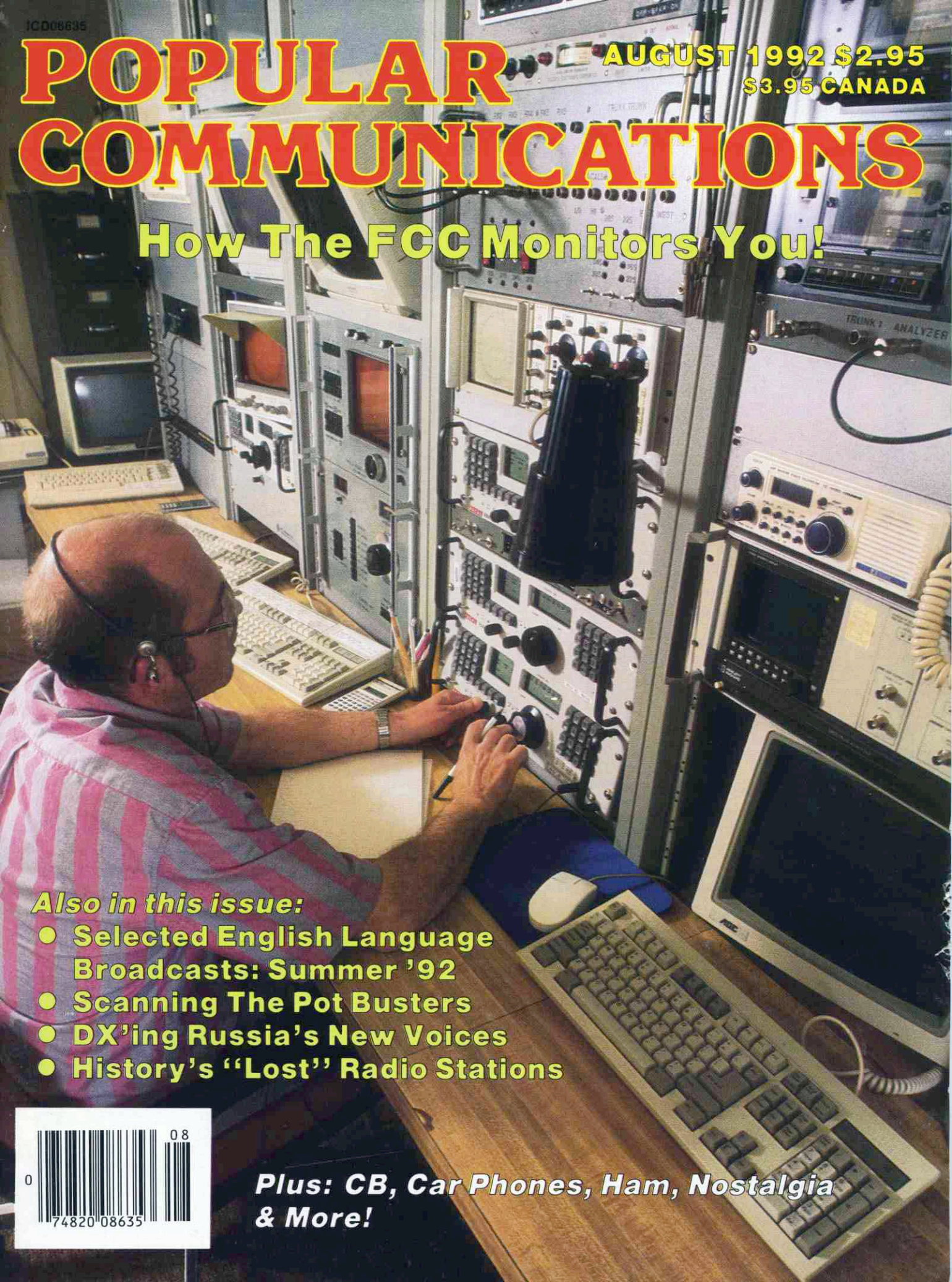
ICD08635

POPULAR COMMUNICATIONS

AUGUST 1992 $2.95
$3.95 CANADA

How The FCC Monitors You!



Also in this issue:

- Selected English Language Broadcasts: Summer '92
- Scanning The Pot Busters
- DX'ing Russia's New Voices
- History's "Lost" Radio Stations

0 74820 08635 08

Plus: CB, Car Phones, Ham, Nostalgia & More!

Zeroed In . . .

We Visit An FCC Monitoring Station!

BY TERRY O'LAUGHLIN, WB9GVB

Would you like to be paid for monitoring the airwaves? As you read this, the staff of the thirteen FCC field monitoring stations are doing just that—tuning the bands for a living. This month *POP'COMM* visits the FCC monitoring post north of Allegan, MI to see them in action. In addition to monitoring duties, Allegan is home to the national training center for the FCC field staff.

The Allegan Monitoring Station is located on highway M40 in rural southwestern Michigan, roughly 100 miles northeast of Chicago. This remote location was chosen because it has good ground conductivity and is electromagnetically quiet. The monitoring post was moved to Allegan from the Great Lakes Naval Base on the north side of Chicago in 1941. Navy space requirements and interference from the base radio transmitters precipitated the move.

Allegan was built in the early days of World War II. Its original purpose was to detect and locate radio transmitters involved in suspected espionage activities. At that time the site was completely fenced and had two military guards, one at the gate and one at the front door.

Today the monitoring post is housed in the original building, a modest two story frame house. The fences are gone. Bristling with antennas, it looks like the home of an avid ham operator or SWL. The surrounding antenna farm covers 216 acres. The technical staff consists of five technicians and four engineers, including the Engineer in Charge, Melvyn Hyman. Mr. Hyman, assisted by Jim Roop, a senior field engineer, gave me an exhaustive and informative tour.

The Allegan facility has one fixed monitoring position and two mobile trucks. A technician or engineer is on duty 24 hours every day, holidays included. During each shift operators have some assigned casework but the listening schedule is left to their discretion. Typical casework includes doing a frequency survey or tracking jamming signals. Ample time is allowed for responding to immediate requests for assistance and for general band scanning. When I arrived, the operator was monitoring a Cuban HF RTTY signal.

The equipment lineup is impressive. The room contains ten racks of gear, capable of monitoring, locating, analyzing and recording any transmission mode on any frequency from 10 KHz to over 1 GHz. Included are three RACAL LF/HF receivers, one R-6790 and two R-6793s, and a Watkins-Johnson WJ-9026A for VHF/UHF. A complete HF RTTY station rests in the end rack. It was used as the main link between monitoring posts but now serves only as a backup for the telephone lines in current use.

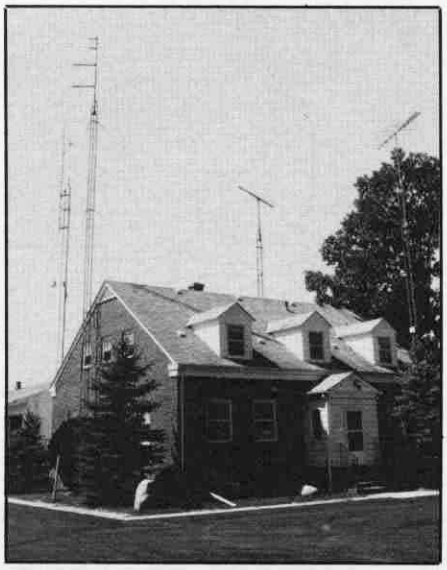
I noticed an ICOM R-7000 receiver upended on the floor. The operator told me that it was not part of the official station but that they had found it useful and almost as good as the mil-spec gear in the racks.

A listening post is only as good as its ears and the antenna farm at Allegan is, by the average listener's standards, awesome. From the highway, two conical monopoles, each capable of handling 50 Kw, dominate the landscape. One is designed for 2–7 MHz and the other for 5–30 MHz. Towers next to the building support two sets of stacked log periodics, one pair for 150–170 MHz and the other for 450–470 MHz, a wideband yagi that is flat from 30-1000 MHz, and several TV and FM antennas. But the real story lies out back, where the HF antennas sprawl over 216 acres.

The heart of the Allegan monitoring post is a circularly disposed array. This antenna consists of sixty elements in a 450 foot circle and a goniometer building in the center. It is capable of determining the direction of an incoming signal within 6 degrees on any frequency from 300 kHz to 40 MHz. The design is similar to the famous Wullenweber DF array used by the military. It was designed by Art Leudtke of the FCC Powder Springs, GA Construction and Installation Branch and built entirely in house. Despite its narrow beamwidth, Leudtke's antenna has no gain.

To ferret out weak HF signals, the operator has two innocuous looking but incredibly effective wire antenna arrays. A set of three high gain beverage antennas stretches 1600 to 2000 feet back to the lot lines. Each beverage antenna can be switched to receive off either end. They are aligned to cover the horizon in 60 degree increments. Sixty feet overhead, a rosette of five rhombics, all of which can be switched to reverse their receiving direction, provide wideband high gain coverage in 36 degree increments. All of these antennas are remote controlled from the monitoring post.

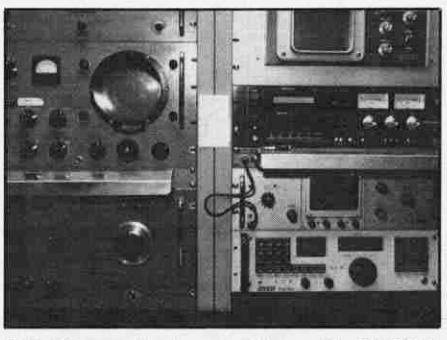
Currently, the main duties of the monitoring post are resolving interference complaints and doing frequency surveys. Military stations sometimes call the FCC for DF work on jamming signals. These usually turn out to be a mike left accidentally keyed on one of their own ships or planes. Occasional requests from the FAA or the Coast Guard for assistance on search and rescue missions can spice up an operator's shift. When the expansion of the AM band into the 1605-1705 KHz was proposed, the FCC logged all activity in that band to determine what was there.



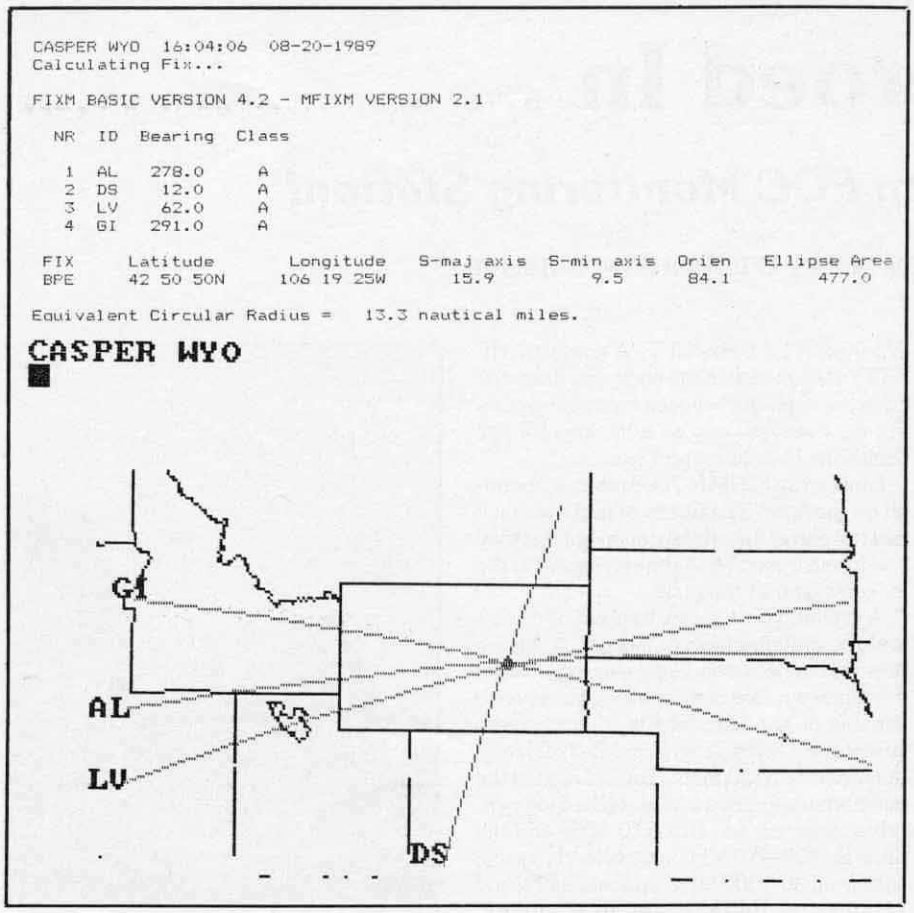
FCC Allegan Monitoring Station.

Pirate radio has been garnering a fair amount of press these days. Mr. Hyman told me that, at Allegan, pirates are not a high priority, despite the publicity. They are more likely to be pursued for their interference to legitimate services than for their ideology.

When an FCC monitoring post operator latches onto a signal that he wishes to locate, he puts out a call on the network for assistance. Other posts that can receive the signal call in with bearings. This data is fed into a computer which compares the information



HF-DF monitoring position with RACAL R-6793 receiver and directional indicator for circularly disposed antenna array.



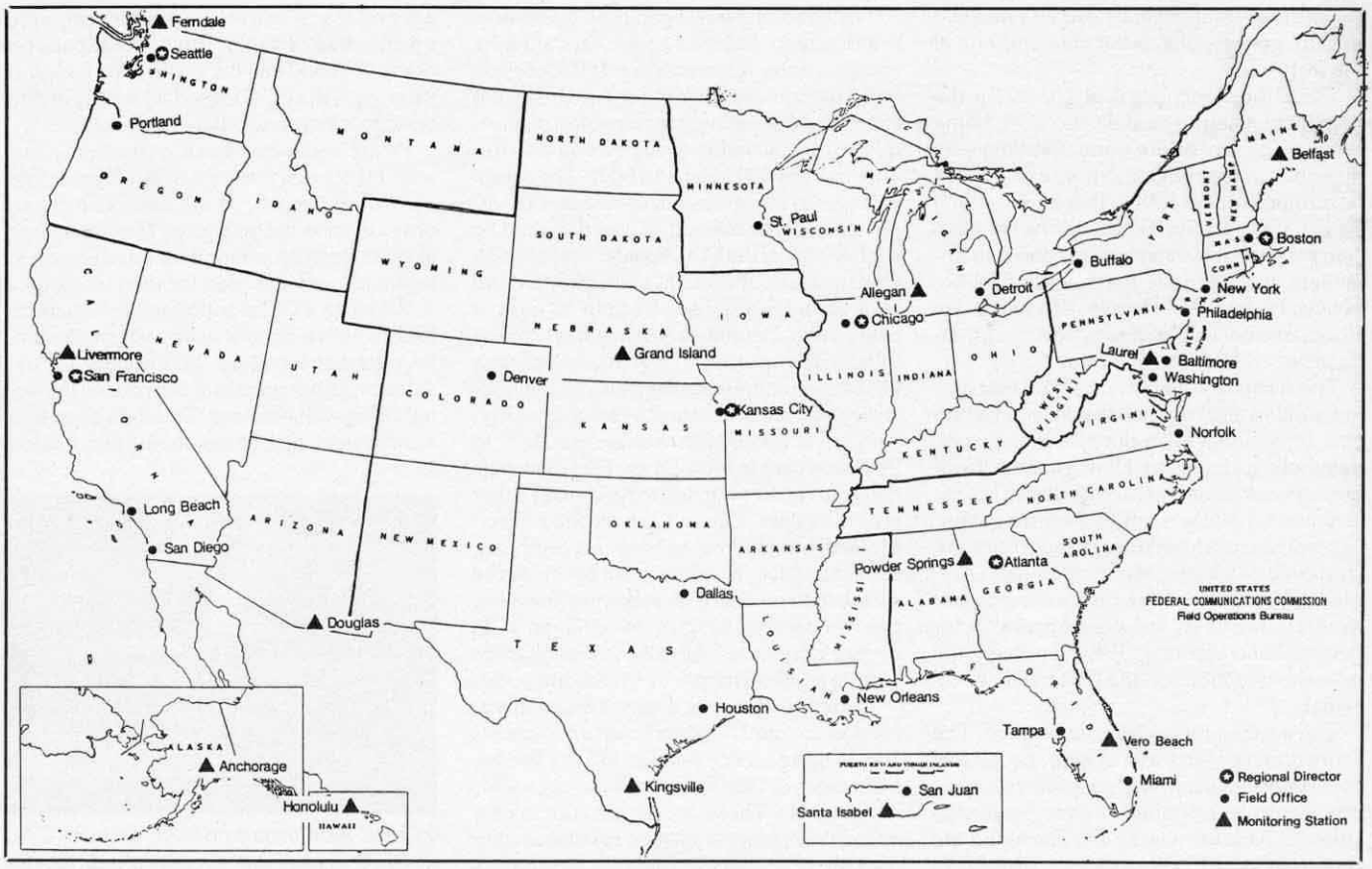
Computer generated ellipse of possible transmitter locations.

and generates an ellipse of probable locations.

Engineer Roop demonstrated the system with bearings from Allegan, MI, Douglas, AZ, Livermore, CA, and Grand Island, NE (see Fig. 1). The computer placed the transmitter location within an ellipse 15.9 by 9.5 miles near Casper, WY. The computer grades the bearing reports and ranks them. Class A readings have a 95% probability of being within 2 degrees of the correct direction. Thus, in this example, an FCC mobile unit dispatched near the center of this ellipse of probable locations would have an excellent chance of being within 13-20 miles of the transmitter. Repeated loggings can improve the accuracy of a fix.

The Allegan monitoring post has seen many changes in its 50 years of operation. Up to the mid sixties, two identical monitoring posts were housed in the building. The mobile units used to be on the road for 30 weeks every year. Now Allegan has one monitoring station and the trucks sit in the garage most of the year. One truck officially doesn't exist and there are no funds to upgrade or replace it. The circularly disposed antenna is decades old and still has nuvistor tubes in the preamps and a motor driven goniometer with selsyns. One RACAL receiver is so old that the paint around the tuning knob has worn through to reveal the aluminum underneath. Federal funding cuts have taken their toll on the FCC.

(continued on page 76)



FOB field installations.

Zeroed In

(from page 10)

Allegan's Engineer in Charge Melvyn Hyman believes the quality of the spectrum is decreasing because of the decline in FCC activity. According to Hyman, there have always been shoddy broadcasting operations and occasional license revocations but now that broadcasting is big business revocations are rare and the FCC fines are a mere slap on the wrist. Amateur radio has lost much of its self-policing aspects and Hyman feels that the quality of activity on the ham bands is declining. Fines and revocations of ham operators, formerly rare occurrences, are on the rise. His opinions are the result of years of experience as an FCC field engineer but, without hard statistical evidence, things are not likely to change.

Regardless of your opinion of the quality of the spectrum and the efficiency of the FCC,

Measurement and recording racks.

Allegan is an impressive facility. It may not be state of the art but, with that antenna farm and quiet location, even my old Collins 51J-3 would pull in some great DX. ■