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AWR Current

# AWR-ASIA

## The Technical Story

As you travel south out of the village of Agat, Guam, you catch the first glimpse of Adventist World Radio-Asia... its impressive orange and white towers against a backdrop of palm trees, lush green hillsides and blue ocean waters. Although the tower and antenna system is the most noticable and imposing part of the station, it takes far more technical equipment than this to put AWR-Asia on the air. To bring results, a shortwave station requires transmitters, cas-

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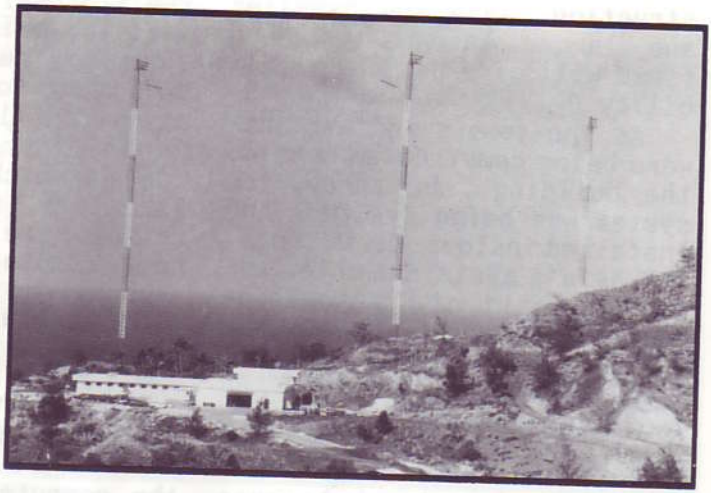
sette tape decks, reel-to-reel machines, computers and much more.

One of the most important pieces of equipment is, of course, the transmitter. Adventist World Radio-Asia has, at this time, two 100,000 watt transmitters built by Thomson CSF of Paris, France. Don Myers, chief engineer at AWR-Asia, said one reason these transmitters were selected was because of their superior efficiency. Myers said the Thomson CSF 100kW transmitters are "10 to 12 percent more efficient than the transmitters made by other companies." Even just a "ten percent increase in the overall efficiency rate will decrease the power consumption bill by a considerable amount." Even though electricity is expensive on Guam, AWR-Asia can save several thousand dollars a year in electricity bills with the Thomson transmitters.

*AWR-Asia as seen from the northernmost tower in antenna system two, still under construction.*

Another reason the Thomson transmitters were chosen was because of their design. The transmitters are made so almost nothing can damage them. Myers says, "For example, if an airplane runs into our antenna and smashes it, the transmitter will shut down before it will hurt itself. Or if somebody damaged its transmission lines or tried to use the antenna switching system during the transmission, the transmitter would shut off so fast that it probably wouldn't hurt anything, including the switches." The transmitters are also built to automatically turn off when there are power surges and power outages, without harm to the expensive tubes and other parts.

Of course, without towers and an antenna, even the best of transmitters would be of no real use, for it is the antenna that sends out the signals which can be picked up on a shortwave radio. AWR's antenna system is designed by T-C-I, Technology for Communication Incorporated in California, United States of America. It is interesting to note that nearly one-third of AWR-Asia's construction budget is designated for the antenna system. Myers said the cost is worth it, though, because "our antennas increase our effectiveness by



*AWR-Asia and antenna system one. Antennas in this system are, on the left, 6-11 Mhz and on the right, 11-21 Mhz. This photo is taken just off Guam's Highway 2.*

as much as 200 times compared with simpler antenna systems."

The towers themselves are made by the Rohn company in Illinois, USA. The antenna and tower system is different than what you would normally see in the United States and Europe. "What you see in the United States generally are of two types," comments Myers. "One type for AM broadcasts uses the tower itself as the radiating device. The other type, for FM and TV, uses the tower only to support the array of elements that are placed on the tower. But in our case the towers are used to support antennas of a curtain variety which hang between the towers."

Therefore, there is considerable "side-loading" on these towers so they are much stronger and stouter than common towers. These (towers) have a 5-foot face, meaning each tower is a triangle 5-by-5-by-5. Myers says, "this accounts for the very heavy guy wires that we have on these towers to keep them from going over sideways." For example, tower three is guyed (tied down) at four levels and there are three guy wires at each level. Tower six will also be guyed at four levels, but there are four guy wires at each level. Each guy wire has a tension of up to 7727 Kilos. The longest guy wire currently on the AWR-Asia site is 1716 meters, stretching from the top of tower three down to its guy anchor.

The antenna curtains are of different sizes depending on the various frequencies in which AWR-Asia broadcasts. The longer ones are for longer waves and the shorter ones are for shorter waves. The large antenna is used for 6 to 11 MHz. The smallest antenna is designated for 11 to 21 MHz. The two new antennas currently under construction will have the capability to broadcast from 9 to 18 MHz and from 6 to 11 MHz. Engineer Brook Powers, who is in charge of tower and antenna con-

struction, said the "smaller and larger antenna on each field will give us more flexibility."

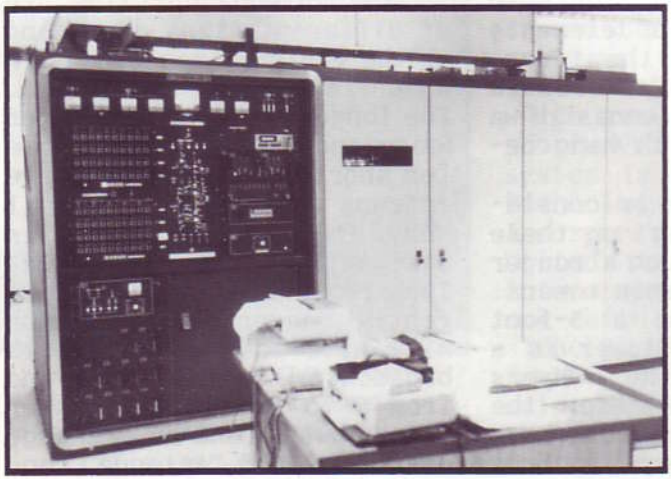
As the towers and antennas were being constructed outside the building, the automation system was being designed and installed inside. Elvin Vence, AWR-Asia's assistant chief engineer, said the automation system used here is designed by I-G-M, of Bellingham, Washington USA, and the "heart of the I-G-M automation system is the I-G-M switcher. It handles much of the work. The reason it is called a switcher is because it selects audio sources, whether it's the Gocart, the single cart machine, the cassette player, reel-to-reel, or even a live performance or a remote machine someplace else."

The reel-to-reel machines used at AWR-Asia are Revox PR 99s. This particular automation system calls for eight reel-to-reel decks, four are used for main programming and four for "dead-roll" and back up. (Dead-roll are music tapes used for fill.)

The four cassette players are Nakamichi MR-2s. They, like the reel-to-reel machines, are rack-mounted and have remote control features used by the switcher.

The carousel cart machines, or Gocarts, are made by I-G-M. The Gocart plays the station announcements as needed.

The I-G-M company uses I-B-M computers. The softwave for the computers is also I-G-M, and it is not necessarily for shortwave broadcasting. Vence said, "It lacks certain things that we are involved in that AM and FM stations don't have, like the frequency changes and slew changes." Vence said the engineering department has adapted the I-G-M system for tasks for which it isn't normally used.



*Pictured here is one of AWR-Asia's two Thomson CSF 100 Kw transmitters.*

*AWR-Asia as seen from just off Guam's Highway 2. The antennas are, from left, 6-11 Mhz, 11-21 Mhz, 6-11 Mhz, and 9-18 Mhz. The latter two are expected to be completed and in service this summer.*

Another piece of equipment AWR-Asia calls on is the Cummins 12-cylinder diesel generator. This 750 kilowatt generator is used to generate emergency power when there are local power outages. For example, during Typhoon Roy, the generator ran the two transmitters and kept the station on the air for more than 48 hours. Chief Engineer Myers said, "It can run the entire operation as long as we can keep the diesel fuel in it."

As most listeners know, shortwave radio is unique in that one station may have the potential to reach the entire world. The radio waves go out into the ionosphere and are reflected back to earth in such a way that they are heard. Myers said, "The degree to which they bounce back actually determines the effectiveness of the signal in a given area. We try to get predictions on the skip. One problem with the ionosphere is that it isn't possible to predict exactly where the waves will bounce, and the sun spot activity determines how well it bounces back." During low sun spot activity, it doesn't bounce back well. The sun spot cycle lasts 11 years, comments Myers, and we're in the "just-beginning-to-improve" part of the cycle. So it is going to be a few years before shortwave is as effective as it can be, but it will continue to get better and better.

(The photo on page one shows Lisa Springett in the master control room at AWR-Asia with the automation system in the background.)

*(The AWR CURRENT would like to thank Kim Ziesmer, traffic coordinator at AWR-Asia for writing this very interesting article. Kim graduated from Southwestern Adventist College in Texas, USA with a degree in communications.)*

# schedule

## AUGUST/SEPTEMBER 1988

(Effective July 31, 1988)

| TIME (UTC) | SUNDAY | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY | SATURDAY | TARGET | FREQ | I/P* |
|---|---|---|---|---|---|---|---|---|---|---|
| 0530-0600 | RUSSIAN | - | - | - | - | - | RUSSIAN | eEU | 9605 | P |
| 0600-0630 | SERBIAN | - | - | - | - | - | - | eEU | 9605 | P |
| 0600-0630 | RUSSIAN | UKRAINIAN | UKRAINIAN | UKRAINIAN | RUSSIAN | RUSSIAN | RUSSIAN | eEU | 7257 | I |
| 0600-0700 | POLISH | - | - | - | - | - | - | eEU | 9670 | I |
| 0630-0700 | ENGLISH | ENGLISH | ENGLISH | ENGLISH | ENGLISH | ENGLISH | ENGLISH | nwEU | 7257 | I |
| 0630-0645 | MACEDONIAN | - | - | - | - | - | - | eEU | 9605 | P |
| 0645-0700 | SLOVENIAN | - | - | - | - | - | - | eEU | 9605 | P |
| 0700-0730 | CROATIAN | - | - | - | - | - | - | eEU | 9605 | P |
| 0700-0730 | SWEDISH | SWEDISH | SWEDISH | SWEDISH | SWEDISH | FINNISH | FINNISH | nEU | 7257 | I |
| 0700-0800 | GERMAN | - | - | - | - | - | - | cEU | 9670 | P |
| 0730-0800 | RUMANIAN | RUMANIAN | SPANISH | SPANISH | SPANISH | SPANISH | SPANISH | eEU/swEU | 7257 | I |
| 0730-0800 | RUMANIAN | - | - | - | - | - | - | eEU | 9605 | P |
| 0800-0830 | UKRAINIAN | - | - | - | - | - | - | eEU | 9605 | P |
| 0800-0830 | ENGLISH | - | - | - | - | - | - | nwEU | 9670 | P |
| 0800-0900 | GERMAN | GERMAN | GERMAN | GERMAN | GERMAN | GERMAN | GERMAN | cEU | 7257 | I |
| 0830-0900 | ARABIC | - | - | - | - | - | - | nAF | 9605 | P |
| 0900-0930 | BULGARIAN | - | - | - | - | - | - | eEU | 9605 | P |
| 0900-0930 | RUSSIAN | UKRAINIAN | UKRAINIAN | UKRAINIAN | RUSSIAN | RUSSIAN | RUSSIAN | eEU | 7257 | I |
| 0930-1000 | BULGARIAN | SLOVENIAN | MACEDONIAN | ALB/GREEK | HUNGARIAN | CROATIAN | SERBIAN | eEU | 7257 | I |
| 1000-1100 | FRENCH | FRENCH | FRENCH | FRENCH | FRENCH | FRENCH | FRENCH | nwEU | 7257 | I |
| 1100-1200 | ITALIAN | ITALIAN | ITALIAN | ITALIAN | ITALIAN | ITALIAN | ITALIAN | cEU | 7257 | I |
| 1200-1300 | GERMAN | GERMAN | GERMAN | GERMAN | GERMAN | GERMAN | GERMAN | cEU | 7257 | I |
| 1300-1330 | BULGARIAN | SLOVENIAN | MACEDONIAN | ALB/GREEK | HUNGARIAN | CROATIAN | SERBIAN | eEU | 7257 | I |
| 1330-1400 | ENGLISH | ENGLISH | ENGLISH | ENGLISH | ENGLISH | ENGLISH | ENGLISH | nwEU | 7257 | I |
| 1400-1500 | ITALIAN | ITALIAN | ITALIAN | ITALIAN | ITALIAN | ITALIAN | ITALIAN | cEU | 7257 | I |

I/P* P= Broadcasts from Portugal, I=Broadcasts from Italy

Alternate frequencies are 7205 and 7125 kHz